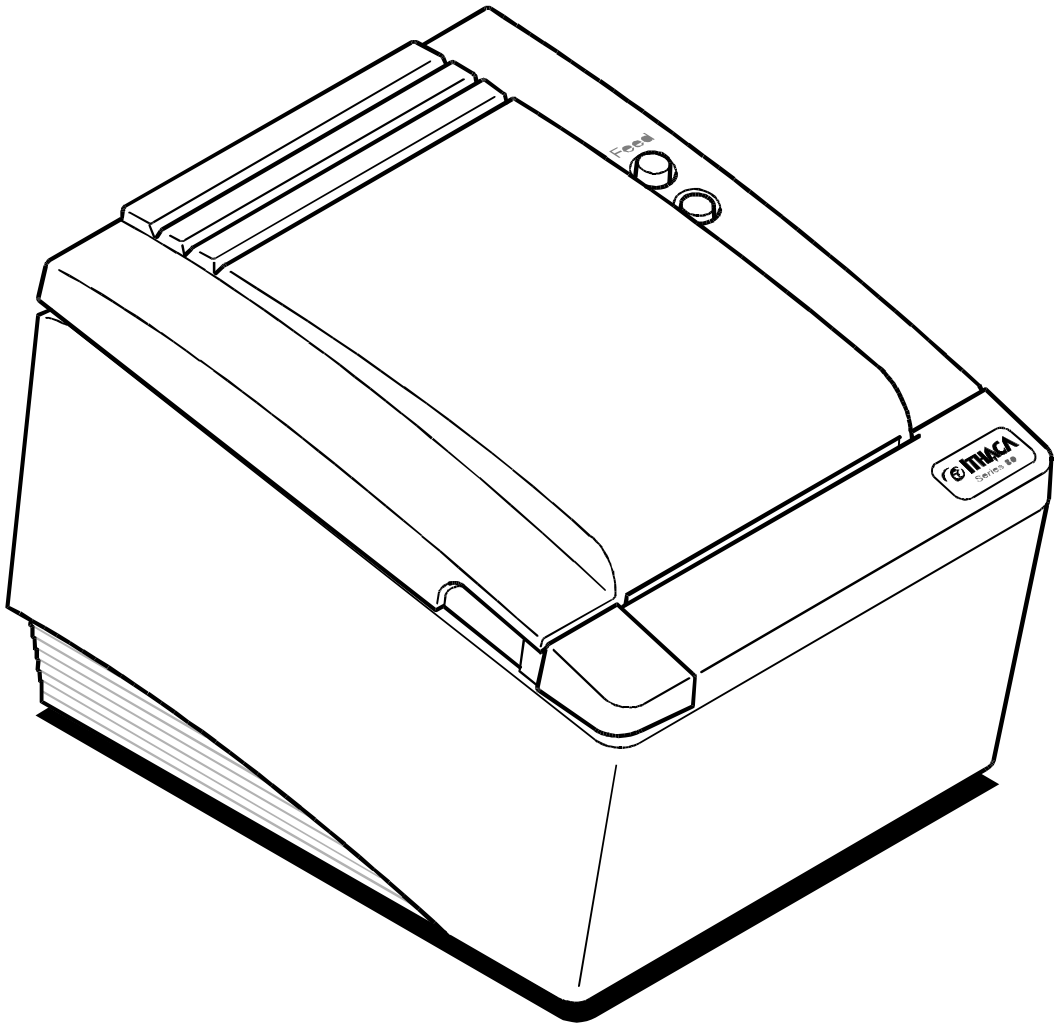
OKIPOS SERIES 80 POS Thermal Printer

PROGRAMMERS GUIDE

Rev B



OKI
People to People Technology

ENG. SPEC.
E.S. 611

Change History	Release Description	EC0#	Date
Rev 01	Initial Release	7588	5/2/97
Rev A	Edit & Release	7613	5/19/97
Rev B	Added Commands for extend Character sets		8/18/97

Disclaimer

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Trademarks

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Federal Communications Commission Radio Frequency Interference Statement
FCC CLASS A

FCC Compliance Statement

For American Users

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

FOR CANADIAN USERS

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigenves du Règlement sur le matériel brouileur du Canada.

DECLARATION OF CONFORMITY

Product Name: Thermal Printer
Type Name: Series 80

These printers conform to the following Directives and Norms

Directive 89/336/EEC
EN 55022 (1995) /A1 (1995)
EN 50082-1 (1992)
IEC 801-2 (1991)
IEC 801-3 (1984)
IEC 801-4 (1991)

Directive 90/384/EEC
EN 45501: (1992)

EMI and SAFETY STANDARDS APPLIED

The following standards are applied only to the printers that are so labeled. (EMC is tested using the Ithaca Bestec BPA-601-24-1984

Europe: CE marking
EN55022 (1995)
EN50082-1 (1992)
EN45501 (1992)

Safety Standard: TÜV EN 60950 (1992)

North America: EMI: FFC Class A
Safety Standards: UL 1950, 3rd Edition (1995)
CAN/CSA-C22.2 No. 950-95, 3rd Edition (1995)

Table of Contents

Setting Up and Using
Section 1:
Change History..... 1-2
Disclaimer 1-2
Copyright 1-2
Trademarks 1-2
Federal Communications Commission Radio Frequency Interference Statement 1-3
Declaration of Conformity 1-4
Section 2:
Table of Contents
Section 3:
Chapter 1 General information.
General Description 3-1
Features:
Printing 3-1
Software 3-1
Paper Handling..... 3-1
Interface Specifications..... 3-2
Serial 3-2
Parallel 3-2
Cash Drawer..... 3-2
Options and Accessories 3-2
Setting Up the Unit
Printer connections 3-3
Interface 3-3
Cash Drawer 3-4
Power Supply 3-5
Installing or Replacing the Paper Roll 3-6
Self-test Mode 3-7
Configuration mode 3-8
Section 4:
Chapter 2 Reference
Printing Specifications 4-1
Paper Specifications 4-3
Electrical Characteristics 4-4
Reliability 4-4
Environmental Conditions 4-4

Section 5:
Chapter 2 Commands
Emulation Modes and Available commands 5-1
Commands Syntax 5-1
Title line 5-1
Command notation 5-2
Explanation of terms 5-2
Supported Commands 5-3
Section 6:
Chapter 4 Operator Panel Controls
Cover Open Button 6-1
Line Feed Button 6-1
Power/Error LED 6-1
Section 7:
Chapter 5 Trouble Shooting
Hexadecimal Dump 7-1
Section 8:
Appendix A Communications
Section 9:
Appendix B. Error Code Diagnosis
Section 10:
Appendix C. Character Code Tables
Section 11:
Appendix D. Operating System Downloading
Section 12:
Appendix E. Ordering Paper and Supplies

WARNING:

Warnings must be followed carefully to avoid serious bodily injury.

CAUTION:

Cautions must be observed to avoid minor injury to yourself or damage to your equipment.

Note:
Notes have important information and useful tips on the operation of your printer.

CHAPTER 1

General information

General Description

FEATURES
The Model 82 is a high-quality POS printers that can print on a thermal paper roll. The printer has the following features:

PRINTING

High speed printing: approximately 24 lines/second (1/6 inch feed).
Low-noise thermal printing.
2.83 inch print zone
Dual cash draw drivers with status
Centronics parallel P1284 nibble, byte mode or RS232C or RS485 interface
Configurable receive, and image buffer areas

SOFTWARE FEATURES:

Command protocol is based on the Axiohm 7193 and ESC/POS™ standard.
Characters can be scaled up to 64 times as large as the standard size.
Bar code printing is possible by using a bar code command. Bar codes can be printed in the vertical direction.
Repeated operation and copy printing are possible by using macro definitions.
Character font size (13 x 24 font or 10 x 24 font) can be selected using a command.
APA Graphics
Custom Image/user defined character set area ,located in non volatile memory.
Self Diagnostics

PRINTER HANDLING

Easy paper roll loading.
An auto-cutter is standard.
The printer allows easy maintenance for tasks such as head cleaning.
The built-in interface provides control capability for two cash drawers.

INTERFACE SPECIFICATIONS

Serial

The Serial interface is a standard RS232 interface on a 9 pin D-Shell connector. It is defined as a standard DTE device. A null model cable is required to interface the printer to another DTE device (a PC). See the serial port description contained in the communications area later in this manual for more information.

Parallel

The Parallel port is a standard 25 Pin D-Shell as defined in the P1284-A standard. See the parallel port description contained in the communications area later in this manual for more information.

Cash Drawer

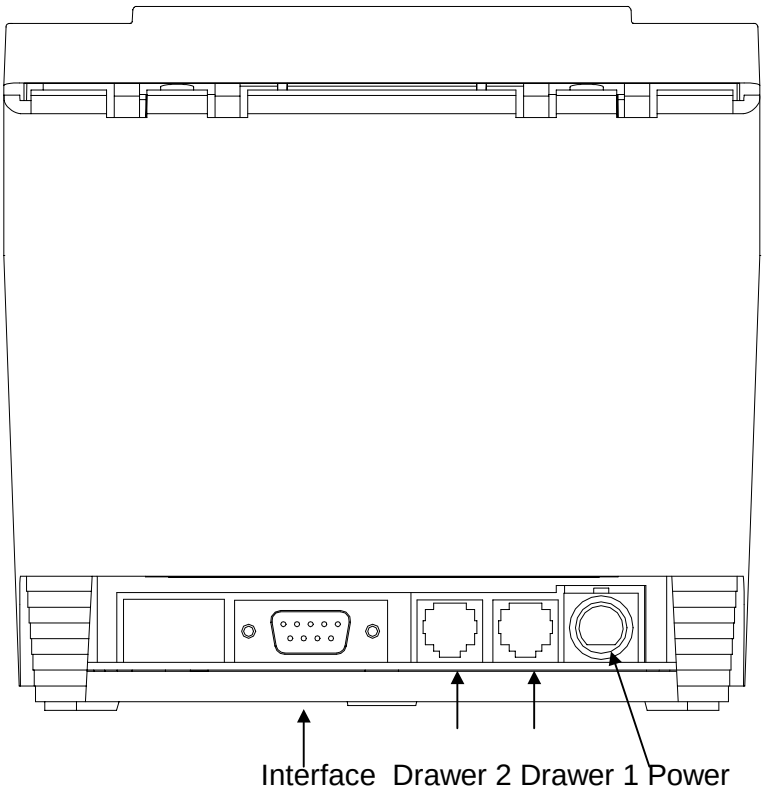
The M80 supports dual cash drawers with status. The interface will provide status and 24 VDC up to 1.25 AMP to the cash drawer. See the cash drawer interface description later in this manual.

OPTIONS AND ACCESSORIES

Power supply - Ithaca Bestec BPA-601-24-1984

SETTING UP THE UNIT

Up to four cables can be connected to the printer, providing for power, host interface, and up to 2 cash draw support. They all connect to the connector panel on the back of the printer, which is shown below:



Connecting the printer and computer

You need an appropriate interface cable. The parallel interface requires a straight through 25 pin connector, with male termination on the printer end, see the interface section for complete pin definition details. The serial interface requires a DB25 to DB9, or DB9 to DB9 pin null modem crossover cable, with a DB9 pin female terminal on the printer end, and the appropriate gender connector at the host computer end, see the communication section for complete pin definition details.

1. Plug the cable connector securely into the printer's interface connector.

2. Tighten the screws on both sides of the cable connector.

3. Attach the other end of the cable to the appropriate terminal on the computer.

CONNECTING CASH DRAWER CABLES

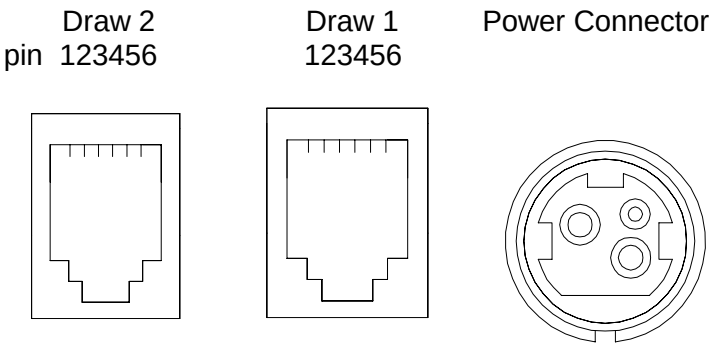
The cash drawer option allows up to two cash drawers to be connected to the printer in a system with a PC that has no connectors for the cash drawer cables.

The cash drawers are operated by software command from the host system through the printer. For additional information on the printer commands used by the host system to activate the cash drawers, see "Control code library" later in this manual.

1. Plug the cash drawer cables into the connectors on the printer.
   The connectors are standard phone connectors.

2. If only one cash drawer is used, plug the cable into the connector labeled 1.

Note: The following illustration shows the pin outs for the cash drawer connectors, as viewed from the rear of the unit. Drawer#2 can be configured to be the same as #1 via jumper J-3



Cash Draw	J9 2-3* Pin #	J9 1-2 Pin #	E030026 - 03 E030027 - 03	Pin #	E030026 - 04 Epson / Axiohm E030027 - 04 Epson / Axiohm
1	1	1	NC	1	NC
	2	2	Status +	2	Drawer 1 Solenoid
	3	3	Status -	3	Drawer 1 or (2 Status Switch Epson)
	4	4	Drawer Drive +	4	+24 Volts (to Solenoid +)
	5	5	Drawer Drive -	5	Drawer 2 Solenoid (* J9 3-4)
	6	6	Frame Ground	6	Ground (Status Switch Return)
2	1	5	Drawer Drive -	1	NC
	2	2	Status -	2	Drawer 2 Solenoid (optional J9 1-2)
	3	3	Status +	3	Drawer 2 Status Switch
	4	4	Drawer Drive +	4	+24 Volts (to Solenoid +)
	5	1	NC	5	Drawer 2 Solenoid
	6	6	Frame Ground	6	Ground (Status Switch Return)

***default**

WARNING:

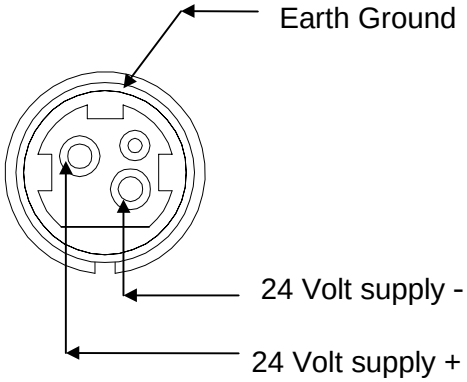
Use a drawer that matches the printer specification. Using an improper drawer may damage the drawer as well as the printer.

CAUTION:

Do not connect a telephone line to the drawer kick-out connector; otherwise the printer and the telephone line may be damaged.

CONNECTING THE POWER SUPPLY

Use the optional Ithaca Bestec BPA-601-24-1984 or equivalent power supply for your printer. The following illustration shows the power cable connector and pin. assignments The power cable connector is a 3pin mini DIN plug and is located in the small cavity under the printer.



WARNING:

Make sure that you use the Ithaca Bestec BPA-601-24-1984 power supply or equivalent. Using an incorrect power supply may cause fire or electrical shock.

CAUTIONS:

If the power supply's rated voltage and your outlet's voltage do not match, contact your dealer for assistance. Do not plug in the power cord. Otherwise, you may damage the power supply or the printer.

1. Make sure that the power supply's power cord is unplugged from the electrical outlet.

2. Check the label on the power supply to make sure that the voltage required by the power supply matches that of your electrical outlet.

3. Plug in the power supply's cable as shown below. Notice that the flat side of the plug faces up.

Note: *To remove the DC cable connector grasp the connector at the arrow and pull it straight out.*

INSTALLING OR REPLACING THE PAPER ROLL

Note:

Be sure to use paper rolls that meet specifications.

1. Make sure that the printer is in the idle state.

2. Open the paper roll cover by pressing the cover-open button located in the forward corner of the printer cover.

3. Remove the used paper roll core if there is one.

4. Insert the paper roll with the shiny side facing down.

5. Assure that a small amount of paper extends over the front side of the printer. Then close the cover until it lock into place.

6. Depress the paper feed button to activate the vertical motor and toss out the scrap paper. Units with a cutter will automatically cut the paper off for you, if your printer does not have a mechanical cutter simple tear the paper off by pulling it against the printer cover at an angle.

Self-test Mode

Description

The Series 80 ESC/POS thermal printer has the ability to print self-test ticket(s) on power-up upon command. The self-test prints a variety of information about the Series 80's operating settings and configuration. The information provided by the self-test is listed below, in order:

Configuration Ticket

Operating system type and version.
Current emulation mode (*Epson TM-T8x* or *Axiohm 7193*)
Interface configuration
Hexdump mode status (on, off)
Carriage return control
Input buffer capacity
User definable RAM buffer capacity
Non-volatile eeprom buffer capacity
Contents of the eeprom buffer (Bit-image, Character set)
Startup macro definition status (yes, no)
Additional Information
Auto Cutter (enabled, disabled)

Print Tickets

The configuration ticket is followed by 10 print tickets: 5 tickets printed at 15 CPI and 5 printed at 20 CPI. Each ticket prints 1 of 5 code pages available at that pitch.

Configuration Mode

Description

The Series 80 ESC/POS thermal printer has many options and features that are user configurable. Unlike most printers that use dip switches to control these settings, the Series 80 has been equipped with an automated configuration mode. By powering the Series 80 on in a special sequence, the printer enters the configuration mode. In this mode, the printer's current settings are printed one at a time. By pressing the **FEED** button, the printer cycles through the remaining available settings for that option. When the setting for the item you desire has been selected, waiting 5 seconds will cause the printer to move on to the next option that you can change. When all options have been exhausted, the Series 80 writes them permanently to its non-volatile eeprom memory and resets itself. See ***Configuration Options*** for an ordered list of options and their associated settings.

Entering the Configuration mode

Follow the steps below to enter the configuration mode:

1. Power the printer off if it is not already off.
2. Open the cover.
3. Power the printer on while holding down the **FEED** button.
4. Wait until the status LED blinks a cover open condition (see *Appendix B*).
5. Release the **FEED** button.
6. Load the printer with paper if it is not already loaded.
7. Close the cover.
8. The Series 80 will print a few lines of instructions followed by:
   Press PAPER FEED to begin
9. If **FEED** is not pressed within 5 seconds, the printer will exit the configuration mode without making any changes and reset.
10. If **FEED** is pressed, the printer will start the configuration mode by displaying the first option and its setting. See ***Configuration Settings*** for an ordered list of options and their associated settings.
11. At this time you may:
    A) Press the **FEED** button to cycles through the choices for this option.
    OR
    B) Wait 5 seconds to continue to the next option.
12. Repeat step 11 until the last option has been completed.
13. The Series 80 will print a message indicating it is exiting the configuration mode and will save the settings exactly as they have been presented/changed.

If the Series 80 is powered off at any time during the configuration mode, no changes will be saved.

The initial setting displayed with each option reflects the current configuration. If you do not wish to change a setting, simply wait 5 seconds to continue to the next option. The printer does not have to be hooked up to a host computer to use the configuration mode.

Configuration Options

The tables below depict the options, in order, presented by the configuration mode. Each options table shows the settings available for a given option, as well as the default setting where applicable:

Emulation Mode
Epson TM-T88 (default)
Epson TM-T85
Axiohm 7193

Carriage Return (CR) Control
Ignore Carriage Return (default)
Line Feed

Line Spacing[1]
7.6 LPI (default)
6 LPI

[1]Only when emulation mode is Axiohm 7193.

Hexidecimal dump Mode
Disabled (default)
Enabled

Input Buffer Size
45 bytes
8192 bytes (default)
16384 bytes
24576 bytes
32768 bytes

User Definable Buffer Size (RAM)
14336 bytes
20480 bytes
26624 bytes
32768 bytes
38912 bytes (default)

Baud Rate[1]
19200 BPS
9600 BPS (default)
4800 BPS
2400 BPS

[1]If printer is equipped with serial interface.

Data bits, Parity, Stop Bits[1]
8,NONE,1 (default)
7,ODD,1
7,EVEN,1
8,NONE,2
8,ODD,1
8,EVEN,1

[1]If printer is equipped with serial interface.

Flow Control[1]
XON/XOFF (default)
DTR/DSR
CTS/RTS
CTS/RTS & DTR/DSR

[1]If printer is equipped with serial interface.

Data Receive Error[1]
Prints '?' (default)
Ignored

[1]If printer is equipped with serial interface.

Auto Cutter Option[1]
Enabled (default)
Disabled

[1]If printer is equipped with auto cutter.

CHAPTER 2
REFERENCE INFORMATION

Printing Specifications

Printing method:	Thermal line printing
Dot density:	203 dpi x 203 dpi [8 dots/mm]
Printing direction:	Unidirectional with friction feed
Printing width:	72 mm (2.83"), 576 dot positions
Characters per line (default):	(Font A) 44 (Font B) 57
Character spacing (default):	0.25 mm (.01") (2 dots) (Font A) 0.25 mm (.01") (2 dots) (Font B) Programmable by control command.
Printing speed:	Approximately 24 lines/second (1/6" inch feed, at 24V, 20^{o} C) Approximately 101.6 mm/second (approximately 4"/second)

NOTES:
Printing speed may be slower, depending on the data transmission speed and the combination of control commands.

The printer switches the mode of the printing speed automatically.

There may be variations in printing after switching the mode of the printing speed. To prevent this for logo printing, using a downloaded bit image is recommended. (Change in printing speed does not occur during downloaded bit image printing).

Paper feeding speed:	Approximately 101.6 mm/second (approximately 4.00"/second) continuous printing

Line Spacing (default): Epson TM-T8x mode: 4.23 mm (1/6")
Axiohm 7193 mode: 3.35 mm (1/7.56")
Programmable by control command.

Number of characters: Alphanumeric characters: 95
International characters: 32

Extended graphics: 128 x 7 pages
(including one space page)

Character structure: Font A: 13 x 24 (including 2-dot spacing in horizontal)

Font B: 10 x 24 (including 2-dot spacing in horizontal)

Font A is the default

	Standard		**Double-height**		**Double-width**		**Double-width/ Double-height**	
	W x H (mm)	**CPL**	**W x H (mm)**	**CPL**	**W x H (mm)**	**CPL**	**W x H (mm)**	**CPL**
Font A 13 × 24	1.38 × 3.00 (.06" × .12")	44	1.63 × 6.00 (.06" × .24")	44	2.75 × 3.00 (.11" × .12")	22	2.75 × 6.00 (.11" × .24")	22
Font B 10 × 24	1.00 × 3.00 (.04" × .12")	57	1.00 × 6.00 (.04" × .24")	57	2.00 × 3.00 (.08" × .12")	28	2.00 × 6.00 (.08" × .24")	28

* CPL = Characters Per Line
* Space between characters is not included
* Characters can be scaled up to 64 times as large as the standard sizes.

Paper Specifications

Paper roll (single-ply):

Size:	Width: 79.5 mm 0.5 mm (3.13" 0.02")
Maximum outside diameter:	101.6 mm (4.0")
Paper roll spool diameter:	Inside: 12 mm (0.47") Outside: 18 mm (0.71") Paper must not be pasted to the paper roll spool.
Width:	80mm + 0.0/- 1.0 mm (3.15" + 0.0/- 0.04")
Thickness:	.06mm to .09mm (0.0024" to 0.0035")

Thermal sensitive layer facing outward on roll

ELECTRICAL CHARACTERISTICS

Supply Voltage:	24 VDC 5% (optional power supply: Ithaca Bestec BPA-601-24-1984).
Current consumption:	Operating: Mean: approximately 3A. Peak: Approximately 5.0A. Standby: Mean: approximately 0.2A.

NOTE: *Maximum 1A for drawer kick-out driving.*

RELIABILITY

MTBF: Mechanism	48,816 Hours @ 12.5% Ratio
Print head life:	50 million pulses, 50 km

ENVIRONMENTAL CONDITIONS

Temperature:	Operating:	0 to 40 C (32 to 104 F)
	Storage:	-40 to 70 C (-40 to 158 F) (except for paper)
Humidity:	Operating:	10% to 90% RH, non-condensing
	Storage:	5% to 90% RH, non-condensing (except for paper)

Chapter 3

Commands

Emulation Modes and Available Commands

The Series 80 ESC/POS thermal printer is capable of emulating an Epson TM-T8x series printer and Axiohm 7193 printer. The Series 80 command set is a combination of the Epson TM-T8x and Axiohm 7193 command sets. Though the Epson TM-8x and Axiohm 7193 share many of the same commands, they do not all produce the same results. Therefore, to ensure complete compatibility, the Series 80 must be configured specifically for either Epson TM-T8x emulation or Axiohm 7193 emulation. The current emulation mode can be obtained at any time by performing a ***Self-test*** (*Chapter 1*), and may be changed at any time via the ***Configuration Mode*** (*Chapter 1*).

All of the commands supported by the Series 80 are available at any time, regardless of the current emulation mode, unless otherwise noted. When the execution of a given command differs depending upon the current emulation mode, it will be noted.

Command Title Line

The following line depicts the title line of a typical command:

Command Name **[*Origin*]**

Command Name is the name of the command.
Origin specifies which printers command set the command comes from.
Origin may take on any combination of the following values:

E	=	*Epson TM-T8x* command set.
A	=	*Axiohm 7193* command set.
I	=	*Series 80* command set.
*****	=	Command has different functions depending upon the current emulation mode.

Command Notation

[Name]	The name of the command.
[Format]	The code sequence. ASCII indicates the ASCII equivalents. Hex indicates the hexadecimal equivalents. Decimal indicates the decimal equivalents. [ ] k indicates the contents of the [ ] should be repeated k times.
[Range]	Gives the allowable ranges for the arguments.
[Default]	Shows the defaults used by the command.
[Description]	Describes the function of the command.
[*Axiohm 7193*]	Information that follows applies only when in Axiohm 7193 emulation mode.
[*Epson TM-T8x*]	Information that follows applies only when in Epson TM-T8x emulation mode.

Explanation of Terms

MSB	Most Significant Bit
LSB	Least Significant Bit
ASB	Automatic Status Back
HRI	Human Readable Interpretation
(k)	Number of bytes specified is × 1024
HEX	Hexadecimal number system, base 16
DEC	Decimal number system, base 10

Supported Commands

Print and Feed Commands

Command	Name	Page Number
LF	Print and line feed	5-7
CR	Print and carriage return	5-7
ESC J	Print and feed paper	5-7
ESC d	Print and feed *n* lines	5-8
DC4	Feed *n* print lines	5-8
NAK	Feed *n* Dot Rows	5-8
ETB	Print	5-7

Line Spacing Commands

Command	Name	Page Number
ESC 2	Select default line spacing	5-8
ESC 3	Set line spacing	5-8
SYN	Add *n* extra dot rows	5-9

Character Commands

Command	Name	Page Number
ESC SP	Set right-side character spacing	5-9
ESC %	Select/cancel user-defined character sets	5-10
ESC &	Define user-defined characters	5-10
ESC ?	Cancel user-defined characters	5-11
ESC R	Select an international character set	5-11
ESC t	Select character code table	5-12
ESC !	Select print mode(s)	5-12
ESC -	Turn underline mode on/off	5-13
ESC E	Turn emphasized mode on/off	5-13
ESC G	Turn double-strike mode on/off	5-13
ESC {	Turns upside-down printing mode on/off	5-14
ESC V	Turn 90^0 rotation mode on/off	5-29
ESC DC2	Turn 90^0 counter-clockwise rotation mode on/off	5-14
GS !	Select character size	5-14
GS B	Turn white/black reverse printing mode on/off	5-15
DC2	Select double-wide characters	5-15
DC3	Select single-wide characters	5-15
ESC SYN	Select pitch (column width)	5-16

Panel Button Commands

Command	Name	Page Number
ESC c 5	Enable/disable panel buttons	5-16

Paper Sensor Commands

Command	Name	Page Number
ESC c 3	Select paper sensor(s) to output paper end signals	5-16
ESC c 4	Select paper sensor(s) to stop printing	5-17

Print Position Commands

Command	Name	Page Number
ESC $	Set absolute print position	5-17
**ESC **	Set relative print position	5-18
ESC a	Select justification	5-18
HT	Horizontal tab	5-18
ESC D	Set horizontal tab positions	5-18
GS L	Set left margin	5-19
GS W	Set printing area width	5-19
ESC DC4	Set column	5-19

Bit-image Commands

Command	Name	Page Number
ESC *	Select bit-image mode	5-20
ESC K	Select 8-dot single-density bit-image mode	5-21
ESC L	Select 8-dot double-density bit-image mode	5-21
ESC Y	Select 8-dot double-density bit-image mode	5-22
GS *	Define downloaded bit-image in the RAM buffer	5-22
GS /	Print downloaded/stored bit-image	5-23

Status Commands

Command	Name	Page Number
GS a	Enable/Disable Automatic Status Back (ASB)	5-25
GS r	Transmit status	5-26
DLE EOT	Real-time status transmission	5-27
ESC u[1]	Transmit peripheral device status	5-30
ESC u[1]	Request alternate status	5-30
ESC u 0[1]	Transmit cash drawer status	5-31
ESC v	Transmit printer status	5-29

[1] Command has different functions depending upon the current emulation mode.

Bar Code Commands

Command	Name	Page Number
GS h	Set bar code height	5-34
GS w	Set bar code width	5-32
GS k	Print bar code	5-33
GS H	Select printing position of HRI characters	5-34
GS f	Select font HRI characters	5-35

Macro Function Commands

Command	Name	Page Number
GS :	Start/end macro definition	5-35
GS ^	Execute macro	5-36
GS _	Delete startup macro definition	5-37

Mechanism Control Commands

Command	Name	Page Number
GS V	Select cut mode and cut paper	5-37
ESC i	Partial Knife Cut	5-37
EM	Full knife cut	5-38
SUB	Partial knife cut	5-38

Miscellaneous Commands

Command	Name	Page Number
GS P	Set horizontal and vertical motion units	5-38
ESC @	Initialize printer	5-38
DLE	Clear printer	5-38
GS I	Transmit printer ID	5-39
ESC p	Generate pulse	5-39
ESC =	Set peripheral device	5-40
DLE ENQ	Real-time request to printer	5-40
ESC ‘	Copy user defined storage buffers	5-41

Extended Language Control Commands

Command	Name	Page Number
ESC [T	Select Code Page	5-43
ESC R	Select Code Page	5-42
ESC ^	Print Control Character	5-44

Print and Feed Commands

LF **[EA]**

[Name] Print and line feed

[Format]

ASCII	LF
Hex	0A
Decimal	10

[Description] Prints the data in the print buffer and feeds one line based on the current line spacing.

ETB **[A]**

[Name] Print

[Format]

ASCII	ETB
Hex	17
Decimal	23

[Description] Prints one line from the buffer and feeds paper one line at the current line height (functions same as **LF** command).

CR **[EA]**

[Name] Print and carriage return

[Format]

ASCII	CR
Hex	0D
Decimal	13

[Default]

[*Epson TM-T8x*] **CR** ignored.

[*Axiohm 7193*] Functions same as **LF**.

[Description] The table below describes the operation of the **LF** command based upon its default setting in the ***Configuration Mode*** (*Chapter 1*):

Paper	**Automatic line feed enabled**	**Automatic line feed disabled**
Paper roll	Functions as same as **LF**	Ignored

ESC J *n* **[EA]**

[Name] Print and feed paper

[Format]

ASCII	ESC	J	*n*
Hex	1B	4A	*n*
Decimal	27	74	*n*

[Range] 0 *n* 255

[Description] Prints the data in the print buffer and feeds the paper [*n* × vertical motion unit].

ESC d *n* **[EA]**

[Name]	Print and feed *n* lines			
[Format]	ASCII	ESC	d	*n*
	Hex	1B	64	*n*
	Decimal	27	100	*n*
[Range]	0 *n* 255			
[Description]	Prints the data in the print buffer and feeds *n* lines.			

DC4 *n* **[A]**

[Name]	Feed *n* print lines		
[Format]	ASCII	DC4	*n*
	Hex	14	*n*
	Decimal	20	*n*
[Range]	0 *n* 255		
[Description]	Feeds the paper *n* lines at the current line height without printing.		

NAK *n* **[A]**

[Name]	Feed *n* Dot Rows		
[Format]	ASCII	NAK	*n*
	Hex	15	*n*
	Decimal	21	*n*
[Range]	0 *n* 255		
[Description]	Feeds the paper *n* dot rows [*n* × vertical motion unit] inches without printing.		

Line Spacing Commands

ESC 2 **[EA]**

[Name]	Select default line spacing		
[Format]	ASCII	ESC	2
	Hex	1B	32
	Decimal	27	50
[Description]	Sets the line spacing to 1/6 inch.		

ESC 3 *n* **[EA]**

[Name]	Set line spacing			
[Format]	ASCII	ESC	3	*n*
	Hex	1B	33	*n*
	Decimal	27	51	*n*
[Range]	0 *n* 255			

[Description]

[*Epson TM-T8x*] Sets the line spacing to [*n* × vertical motion unit].

[*Axiohm 7193*]Sets the line spacing to [*n* × (1/360")].

SYN *n* **[A]**

[Name] Add *n* extra dot rows

[Format]

ASCII	SYN	*n*
Hex	16	*n*
Decimal	22	*n*

[Range] 0 *n* 12

[Default]

[*Epson TM-T8x*] *n* = 23, 6 lines/inch with vertical motion unit = 1/360.

[*Axiohm 7193*] *n* = 2, 7.6 lines/inch with vertical motion unit = 1/152.

[Description] Adds *n* extra dot rows [*n* × vertical motion unit] to the character height to increase space between print lines or decrease the number of lines per inch.

The following sample table shows the relationship between the number of lines per inch and each extra dot row added in Axiohm 7193 emulation mode with the vertical motion unit set to (1/152"):

Extra Rows	Lines Per Inch	Dot Rows
0	8.5	18
1	8.0	19
2	7.6	20
3	7.2	21
4	7.0	22
5	6.6	23
6	6.3	24
7	6.1	25
8	5.9	26
9	5.6	27
10	5.4	28
11	5.2	29
12	5.1	30

Character Commands

ESC SP *n* **[EA]**

[Name] Set right-side character spacing

[Format]

ASCII	ESC	SP	*n*
Hex	1B	20	*n*
Decimal	27	32	*n*

[Range] 0 *n* 255

[Description] Sets the character spacing for the right side of the character to [*n* × horizontal motion unit].

ESC % *n* **[EA]**

[Name] Select/cancel user-defined character sets

[Format]

ASCII	ESC	%	*n*
Hex	1B	25	*n*
Decimal	27	37	*n*

[Range] *See table below.*

[Description] Selects or cancels a user-defined character set as defined below:

Table of *n*

Hex	Decimal	Function
00	0	Selects code page 437 and turns off user defined set.
01	1	Selects user defined character set in the RAM buffer
02	2	Selects code page 850 and turns off user defined set.
41	65	Selects user defined character set in non-volatile eeprom buffer.

If the user defined character set in RAM is selected and the set does not exist, an empty set will be created. Any user defined bit-image will be erased. Any characters referenced that are not defined will be replaced as follows: equivalent code page 437 character in Axiohm 7193 emulation; equivalent current code page character in Epson TM-T8x emulation.

If the user defined character set in the non-volatile eeprom buffer is selected and the set does not exist, this command will be ignored (*See the **GS '** command for saving a user defined character set in the RAM buffer to the non-volatile eeprom buffer*).

ESC & *y cl c2* [*x1 d1...d(y × x1)*]...[*xk d1...d(y × xk)*] **[EA]**

[Name] Define user-defined characters

[Format]

ASCII	ESC	&	*y*	*c1*	*c2*	[*x1 d1...d(y × x1)*]...[*xk d1...d(y × xk)*]
Hex	1B	26	*y*	*c1*	*c2*	[*x1 d1...d(y × x1)*]...[*xk d1...d(y × xk)*]
Decimal	27	38	*y*	*c1*	*c1*	[*x1 d1...d(y × x1)*]...[*xk d1...d(y × xk)*]

[Range] *y* = 3

0 *x* 13 Font A (13 × 24)

0 *x* 10 Font B (10× 24)

0 *d1 ... d*(*y* × *xk*) 255

k = c2-c1+1

[Axiohm 7193]

32 *c1* *c2* 254

[Epson TM-T8x]

32 *c1* *c2* 126

[Description] Defines user-defined characters.

y specifies the number of bytes in the vertical direction.

c1 specifies the beginning character code for the definition, and *c2* specifies the final code.
x specifies the number of dots in the horizontal direction.
d is the dot data for the characters. The dot pattern is in the horizontal direction from the left side. Any remaining dots on the right side are blank.
The allowable character code range differs between Epson and Axiohm emulation. See *[Range]* above.
The data to define a user-defined character is ($y \times x$) bytes.
Set a corresponding bit to 1 to print a dot or 0 to not print a dot.
In Epson emulation mode, there is a unique user defined character set for each pitch.
In Axiohm emulation mode, both pitches share the same user defined character set.

ESC ? *n* **[E]**

[Name]	Cancel user-defined characters			
[Format]	ASCII	ESC	?	*n*
	Hex	1B	3F	*n*
	Decimal	27	63	*n*
[Range]				
[Axiohm 7193]	32 *n* 254			
[Epson TM-T8x]	32 *n* 126			
[Description]	Cancels user-defined characters.			

ESC R *n* **[E]**

[Name]	Select an international character set			
[Format]	ASCII	ESC	R	*n*
	Hex	1B	52	*n*
	Decimal	27	82	*n*
[Range]	0 *n* 10			
[Default]	*n* = 0			
[Description]	Selects an international character set *n* from the following table:			

n	**Character set**
0	U.S.A
1	France
2	Germany
3	U.K.
4	Denmark I
5	Sweden
6	Italy
7	Spain
8	Japan
9	Norway
10	Denmark II

ESC t *n* **[E]**

[Name] Select character code table

[Format]				
	ASCII	ESC	t	*n*
	Hex	1B	74	*n*
	Decimal	27	116	*n*

[Range] 0 *n* 5, *n* = 255

[Default] *n* = 0

[Description] Selects a page *n* from the character code table.

n	**Character Code Table**
0	Page 0 (PC437 (U.S.A., Standard Europe))
1	Page 1 (PC850 (Multilingual))
2	Page 2 (PC850 (Multilingual))
3	Page 3 (PC860 (Portuguese))
4	Page 4 (PC863 (Canadian-French))
5	Page 5 (PC865 (Nordic))
255	Page 255 (Space page)

ESC ! *n* **[EA]**

[Name] Select print mode(s)

[Format]				
	ASCII	ESC	!	*n*
	Hex	1B	21	*n*
	Decimal	27	33	*n*

[Range] 0 *n* 255

[Description] Selects print mode(s) using n as follows:

Bit	**Off/On**	**Hex**	**Decimal**	**Function**
0	Off	00	0	Character font A (13 × 24)
	On	01	1	Character font B (10 × 24).
1, 2	-	-	-	Undefined.
3	Off	00	0	Emphasized mode not selected.
	On	08	8	Emphasized mode selected.
4	Off	00	0	Double-height mode not selected.
	On	10	16	Double-height mode selected.
5	Off	00	0	Double-width mode not selected.
	On	20	32	Double-width mode selected.
6	-	-	-	Undefined.
7	Off	00	0	Underline mode not selected.
	On	80	128	Underline mode selected.

Determine the values of *n* by adding the values of all the characteristics you want to select.

ESC - *n* **[E]**

[Name]	Turn underline mode on/off			
[Format]	ASCII	ESC	-	*n*
	Hex	1B	2D	*n*
	Decimal	27	45	*n*
[Range]	0 *n* 2, 48 *n* 50			
[Description]	Turns underline mode on or off, based on the following values of *n*:			

n	**Function**
0, 48	Turns off underline mode
1, 49	Turns on underline mode (2-dots thick)
2, 50	Turns on underline mode (2-dots thick)

ESC E *n* **[E]**

[Name]	Turn emphasized mode on/off			
[Format]	ASCII	ESC	E	*n*
	Hex	1B	45	*n*
	Decimal	27	69	*n*
[Range]	0 *n* 255			
[Description]	Turns emphasized mode on or off			

When the LSB is 0, emphasized mode is turned off.
When the LSB is 1, emphasized mode is turned on.

ESC G *n* **[E]**

[Name]	Turn double-strike mode on/off			
[Format]	ASCII	ESC	G	*n*
	Hex	1B	47	*n*
	Decimal	27	71	*n*
[Range]	0 *n* 255			
[Description]	Turns double-strike mode on or off.			

When the LSB is 0, double-strike mode is turned off.
When the LSB is 1, double-strike mode is turned on.

ESC { *n* **[E]**

[Name]	Turns upside-down printing mode on/off			
[Format]	ASCII	ESC	{	*n*
	Hex	1B	7B	*n*
	Decimal	27	123	*n*
[Range]	0 *n* 255			
[Description]	Turns upside-down printing mode on or off.			

When the LSB is 0, upside-down printing mode is turned off.

When the LSB is 1, upside-down mode is turned on.

[*Axiohm 7193*]

Counter-clockwise rotation, **ESC DC2**, is turned off when upside-down printing mode is turned on.

ESC V *n* **[EAI]**

[Name]	Turn 90^0 rotation mode on/off			
[Format]	ASCII	ESC	V	*n*
	Hex	1B	56	*n*
	Decimal	27	86	*n*
[Range]	*n* = 0, 1, 2, 48, 49, 50			
[Description]	Turns 90^0 clockwise rotation mode on/off n is used as follows:			

n	**Function**
0, 48	Turns off all rotation modes
1, 49	Turns on 90^0 clockwise rotation mode
2, 50	Turns on 90^0 counter-clockwise rotation mode

ESC DC2 **[A]**

[Name]	Turn 90^0 counter-clockwise rotation mode on/off		
[Format]	ASCII	ESC	DC2
	Hex	1B	12
	Decimal	27	18
[Description]	Rotates characters 90 degrees counter-clockwise. It remains in effect until the printer is reset or until a **Clear Printer (10), Set/Cancel Upside - Down Print (1B 7B), or Set/Cancel Rotated Print (1B 56)** command is received		

GS ! n **[E]**

[Name]	Select character size			
[Format]	ASCII	GS	!	*n*
	Hex	1D	21	*n*
	Decimal	29	33	*n*
[Range]	0 *n* 255			

(1 vertical number of times 8, 1 horizontal number of times 8)

[Description] Selects the character height using bits 0 to 2 and selects the character width using bits 4 to 7, as follows:

Character Width Selection

Hex	Decimal	Width
00	0	1 (normal)
10	16	2 (double-width)
20	32	3
30	48	4
40	64	5
50	80	6
60	96	7
70	112	8

Character Height Selection

Hex	Decimal	Height
00	0	1 (normal)
01	1	2 (double-height)
02	2	3
03	3	4
04	4	5
05	5	6
06	6	7
07	7	8

GS B *n* **[E]**

[Name] Turn white/black reverse printing mode on/off

[Format]

ASCII	GS	B	*n*
Hex	1D	42	*n*
Decimal	29	66	*n*

[Range] 0 *n* 255

[Description] Turns on or off white/black reverse printing mode.

When the LSB is 0, white/black reverse mode is turned off.
When the LSB is 1, white/black reverse mode is turned on.

DC2 **[A]**

[Name] Select double-wide characters

[Format]

ASCII	DC2
Hex	12
Decimal	18

[Description] Prints double-wide characters. The printer is reset to single-wide mode after a line has been printed or a **Clear Printer (10)** command is received.

DC3 **[A]**

[Name] Select single-wide characters

[Format]

ASCII	DC3
Hex	13
Decimal	19

[Description] Prints single-wide characters

ESC SYN *n* **[A]**

[Name]	Select pitch (column width)			
[Format]	ASCII	ESC	SYN	*n*
	Hex	1B	16	*n*
	Decimal	27	22	*n*
[Range]	0 = Standard (44 col/15.61 CPI)			
	1 = Compressed (57 col/20.3 CPI)			
[Default]	*n* = 0			
[Description]	Selects the character pitch for a print line. See "Appendix B" for a description of both pitches.			

Panel Button Commands

ESC c 5 *n* **[EA]**

[Name]	Enable/disable panel buttons				
[Format]	ASCII	ESC	c	5	*n*
	Hex	1B	63	35	*n*
	Decimal	27	99	53	*n*
[Range]	0 *n* 255				
[Description]	Enables or disables the panel buttons.				

When the LSB is 0, the panel buttons are enabled.
When the LSB is 1, the panel buttons are disabled.
In Epson TM-T8x emulation mode, the **ESC @** command will re-enable the panel buttons.

Paper Sensor Commands

ESC c 3 *n* **[E]**

[Name]	Select paper sensor(s) to output paper end signals				
[Format]	ASCII	ESC	c	3	*n*
	Hex	1B	63	33	*n*
	Decimal	27	99	51	*n*
[Range]	0 *n* 255				
[Description]	Selects the paper sensor(s) to output paper end signals. This command is available only with a parallel interface and is ignored with a serial interface.				

Each bit of *n* is used as follows:

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Ignored.
	On	01	1	Ignored.
1	Off	00	0	Ignored.
	On	02	2	Ignored.
2	Off	00	0	Paper roll end sensor disabled.
	On	04	4	Paper roll end sensor enabled.
3	Off	00	0	Paper roll end sensor disabled.
	On	08	8	Paper roll end sensor enabled.
4-7	-	-	-	Undefined.

ESC c 4 *n* **[E]**

[Name] Select paper sensor(s) to stop printing

[Format]	ASCII	ESC	c	4	*n*
	Hex	1B	63	34	*n*
	Decimal	27	99	52	*n*

[Range] 0 *n* 255

[Description] This command is not supported and is ignored if received.

Print Position Commands

ESC $ *nL nH* **[EA]**

[Name] Set absolute print position

[Format]	ASCII	ESC	$	*nL*	*nH*
	Hex	1B	24	*nL*	*nH*
	Decimal	27	36	*nL*	*nH*

[Range] 0 *nL* 255
0 *nH* 255

[Description] Sets the print starting position from the beginning of the line.

[Epson TM-T8x]

The distance in dots from the beginning of the line to the print position is [(*nL* + *nH* × 256) × (horizontal motion unit)].

[Axiohm 7193]

If non-graphics follow this command, the distance in dots from the beginning of the line to the print position is [(*nL* + *nH* × 256) × (horizontal motion unit)].

If graphics follow this command, the distance in dots from the beginning of the line to the print position is [(*nL* + *nH* × 256) × (horizontal motion unit)] / 2.

ESC \ *nL nH* **[EA]**

[Name]	Set relative print position				
[Format]	ASCII	ESC	\	*nL*	*nH*
	Hex	1B	5C	*nL*	*nH*
	Decimal	27	92	*nL*	*nH*
[Range]	0 *nL* 255				
	0 *nH* 255				
[Description]	Sets the print starting position based on the current position.				

This command sets the distance from the current position to [(*nL* + *nH* × 256) × horizontal unit].

ESC a *n* **[EA]**

[Name]	Select justification			
[Format]	ASCII	ESC	a	*n*
	Hex	1B	61	*n*
	Decimal	27	97	*n*
[Range]	0 *n* 2, 48 *n* 50			
[Description]	Aligns all the data in one line to the specified position *n* selects the justification as follows:			

n	**Justification**
0, 48	Left Justification
1, 49	Centering
2, 50	Right Justification

HT **[EA]**

[Name]	Horizontal tab	
[Format]	ASCII	HT
	Hex	09
	Decimal	9
[Description]	Moves the print position to the next horizontal tab position if that position exists.	

ESC D *n1 ... nk* NUL **[EA]**

[Name]	Set horizontal tab positions				
[Format]	ASCII	ESC	D	*n1 ... nk*	NUL
	Hex	1B	44	*n1 ... nk*	00
	Decimal	27	68	*n1 ... nk*	0
[Range]	1 *n* 255				
	0 *k* 32				
[Default]	Every 8 characters for the 13×24 font.				

[Description] Sets horizontal tab positions.

n specifies the column number for setting a horizontal tab position from the beginning of the line.
k indicates the total number of horizontal tab positions to be set.
Epson and Axiohm emulation modes treat tab positions differently depending upon factors such as character pitch, expansion and rotation.

GS L *nL nH* **[E]**

[Name]	Set left margin				
[Format]	ASCII	GS	L	*nL*	*nH*
	Hex	1D	4C	*nL*	*nH*
	Decimal	29	76	*nL*	*nH*
[Range]	0 *nL* 255				
	0 *nH* 255				

[Description] Sets the left margin using *nL* and *nH*.

The left margin is set to [(*nL* + *nH* 256) horizontal motion unit)] from the beginning of the line.

GS W *nL nH* **[E]**

[Name]	Set printing area width				
[Format]	ASCII	GS	W	*nL*	*nH*
	Hex	ID	57	*nL*	*nH*
	Decimal	29	87	*nL*	*nH*
[Range]	0 *nL* 255				
	0 *nH* 255				

[Description] The printing area width is set to [(*nL* + *nH* 256) horizontal motion unit)] from the left margin.

ESC DC4 *n* **[A]**

[Name]	Set column			
[Format]	ASCII	ESC	DC4	*n*
	Hex	1B	14	*n*
	Decimal	27	20	*n*
[Range]	1 *n* 44 (Standard Pitch)			
	1 *n* 57 (Compressed Pitch)			
	if *n* is set to 0, 1 is assumed.			

[Description] Prints the first character of the next print line in column *n*. It must be sent for each line not printed at column one. The value of *n* is set to one after each line.

Bit-Image Commands

ESC * *m nL nH d1 ... dk* [EA]

[Name] Select bit-image mode

[Format]

ASCII	ESC	*	*m*	*nL*	*nH*	*d1 ... k*
Hex	1B	2A	*m*	*nL*	*nH*	*d1 ... k*
Decimal	27	42	*m*	*nL*	*nH*	*d1 ... k*

[Range] *m* = 0, 1, 32, 33

0 *nL* 255

0 *nH* 3

0 *d* 255

[Description] Selects a bit-image mode using *m* for the number of dots specified by *nL* and *nH*, as follows:

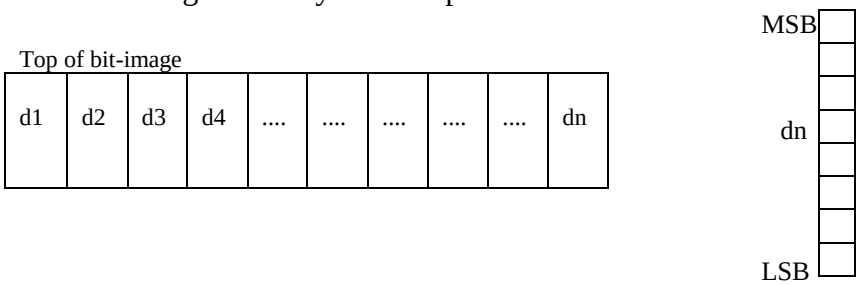
		Vertical Direction		Horizontal Direction	
m	**Mode**	**Number of Dots**	**Density (DPI)**	**Density (DPI)**	**Amount of Data (k)**
0	8-dot single-density	8	68	102	nL + nH × 256
1	8-dot double-density	8	68	203	nL + nH × 256
32	24-dot single-density	24	203	102	(nL + nH × 256) × 3
33	24-dot double-density	24	203	203	(nL + nH × 256) × 3

The *nL* and *nH* indicate the number of dots of the bit image in the horizontal direction. The number of dots is calculated by *nL* + *nH* × 256.

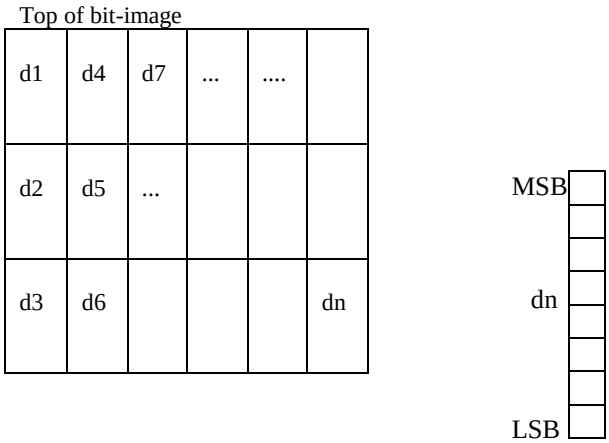
If the bit-image data input exceeds the number of dots to be printed on a line, the excess data is ignored.

d indicates the bit-image data. Set a corresponding bit to 1 to print a dot or to 0 to not print a dot.

8-Dot Single-Density Mode representation



24-Dot Single-Density Mode representation



ESC K *nL nH d1 ... dk* **[A]**

[Name] Select 8-dot single-density bit-image mode

[Format]

ASCII	ESC	K	*nL*	*nH*	*d1 ... k*
Hex	1B	4B	*nL*	*nH*	*d1 ... k*
Decimal	27	75	*nL*	*nH*	*d1 ... k*

[Range] 0 *nL* 255
0 *nH* 3
0 *d* 255

[Description] See **ESC *** for a complete description of 8-dot single-density bit-image mode.

ESC L *nL nH d1 ... dk* **[A]**

[Name] Select 8-dot double-density bit-image mode

[Format]

ASCII	ESC	L	*nL*	*nH*	*d1 ... k*
Hex	1B	4C	*nL*	*nH*	*d1 ... k*
Decimal	27	76	*nL*	*nH*	*d1 ... k*

[Range] 0 *nL* 255
0 *nH* 3
0 *d* 255

[Description] See **ESC *** for a complete description of 8-dot double-density bit-image mode.

ESC Y *nL nH d1 ... dk* [A]

[Name]	Select 8-dot double-density bit-image mode					
[Format]	ASCII	ESC	Y	*nL*	*nH*	*d1 ... k*
	Hex	1B	59	*nL*	*nH*	*d1 ... k*
	Decimal	27	89	*nL*	*nH*	*d1 ... k*
[Range]	0 *nL* 255					
	0 *nH* 3					
	0 *d* 255					

[Description] See **ESC *** for a complete description of 8-dot double-density bit-image mode.

GS * *x y d1 ... d(x × y × 8)* [EA]

[Name]	Define downloaded bit-image in the RAM buffer					
[Format]	ASCII	GS	*	*x*	*y*	*d1 ... d(x y 8)*
	Hex	1D	2A	*x*	*y*	*d1 ... d(x y 8)*
	Decimal	29	42	*x*	*y*	*d1 ... d(x y 8)*
[Range]	1 *x* 255					
	1 *y* 48					
	0 *d* 255					

[Description] Defines a downloaded bit-image using the number of dots specified by *x* and *y* in the RAM buffer area (volatile memory).

The number of dots in the horizontal direction is *x* 8.

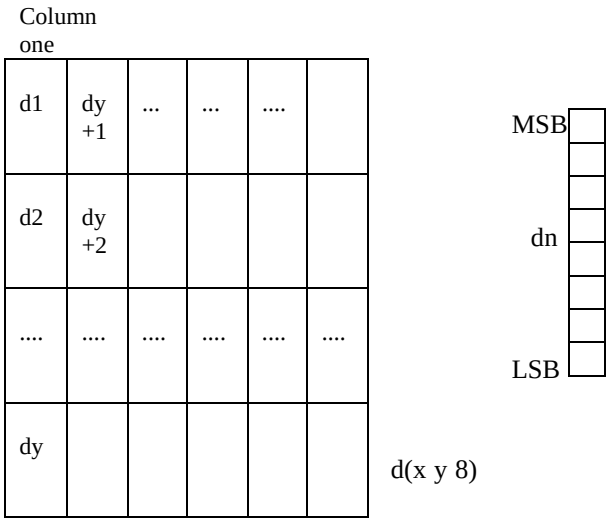
The number of dots in the vertical direction is *y* 8.

If (*x* × *y* × 8) exceeds the size of the buffer in bytes, the image will be truncated in the appropriate directions (the image buffer size is adjustable via the ***Configuration Mode***, *Chapter 1*).

d indicates bit-image data. Data (*d*) specifies a bit printed to 1 and not printed to 0.

After a downloaded bit-image is defined it may be saved to the non-volatile eeprom storage buffer using the **ESC ‘** command where it will remain indefinitely. Otherwise, the image will remain in the RAM buffer where it is available until **ESC @** or **ESC &** is executed; the printer is reset; or the power is turned off.

A representation of the format of a downloaded bit-image is depicted below:



GS / *m* **[EAI]**

[Name] Print downloaded/stored bit-image

[Format]				
	ASCII	GS	/	*m*
	Hex	1D	2F	*m*
	Decimal	29	47	*m*

[Description] Prints a downloaded or stored bit-image using the mode specified by *m*. *m* selects a mode from the table below:

m	**Off/On**	**Hex**	**Decimal**	**Function**
0-2	*	*	*	See ***Mode Table*** below
3-5	-	-	-	Ignored.
6	On	40	64	Print image in user defined non-volatile eeprom storage.
	Off	00	00	Print image in user defined RAM storage.
7	-	-	-	Ignored.

Mode Table				
Hex	**Decimal**	**Mode**	**Vertical Dot Density (DPI)**	**Horizontal Dot Density (DPI)**
01	1	Normal	203	203
02	2	Double-width	203	101
03	3	Double-height	101	203
04	4	Quadruple	101	101

If the printer is commanded to print a user defined bit-image from the RAM buffer and that image does not exist, the printer will check the non-volatile eeprom buffer for a saved user defined bit-image and print that image if it exists. Existing applications not programmed to make use of the eeprom storage buffer can use this fact to take advantage of non-volatile user defined bit-images.

Status Commands

GS a n **[E]**

[Name] Enable/Disable Automatic Status Back (ASB)

[Format]				
	ASCII	GS	a	*n*
	Hex	1D	61	*n*
	Decimal	29	97	*n*

[Range] 0 *n* 255

[Default] *n* = 0

[Description] Enables or disables ASB. ASB is enabled if any item is selected. The printer automatically generates a 4-byte status message whenever the status changes. Multiple status items can be selected. When *n* = 0, ASB is disabled. If ASB is enabled when the printer is disabled by the **ESC =** command, the printer transmits a 4-byte status message whenever the status changes. The status items are selected using *n* as follows:

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Drawer kick-out connector status disabled.
	On	01	1	Drawer kick-out connector status enabled.
1	Off	00	0	On-line/off-line status disabled.
	On	02	2	On-line/off-line status enabled.
2	Off	00	0	Error status disabled.
	On	04	4	Error status enabled.
3	Off	00	0	Paper roll sensor status disabled.
	On	08	8	Paper roll sensor status enabled.
4-7	-	-	-	Undefined.

First byte (Printer information)

Bit	Off/On	Hex	Decimal	Status for ASB
0	Off	00	0	Not used. Fixed to Off.
1	Off	00	0	Not used. Fixed to Off.
2	Off	00	0	Drawer 1 or 2 kick-out connector status is LOW**.
	On	04	4	Drawer 1 or 2 kick-out connector status is HIGH**.
3	Off	00	0	On-Line.
	On	08	8	Off-Line.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	Cover Closed.
	On	20	32	Cover Opened.
6	Off	00	0	Paper is not being fed by the paper feed button.
	On	40	64	Paper is being fed by the paper feed button.
7	Off	00	0	Not used. Fixed to Off.

** See Appendix X for Cash drawer connector information.

Second Byte (error information)

Bit	Off/On	Hex	Decimal	Status for ASB
0-2	-	-	-	Undefined.
3	Off	00	0	No auto-cutter error.
	On	08	8	Auto-cutter error occurred.
4	Off	00	0	Not used. Fixed to Off.
5	Off	00	0	No unrecoverable error.
	On	20	32	Unrecoverable error occurred.
6	Off	00	0	No automatically recoverable error occurred.
	On	40	64	Automatically recoverable error occurred.
7	Off	00	0	Not used. Fixed to Off.

Third byte (paper sensor information)

Bit	Off/On	Hex	Decimal	Status for ASB
0,1	-	-	-	Not used. Fixed to Off.
2,3	Off	00	0	Paper roll sensor: paper present.
	On	0C	12	Paper roll sensor: paper NOT present.
4	Off	00	0	Not used. Fixed to Off.
5,6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

Fourth byte (paper sensor information)

Bit	Off/On	Hex	Decimal	Status for ASB
0-3	-	-	-	Undefined.
4	Off	00	0	Not used. Fixed to Off.
5,6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

GS r n **[E]**

[Name] Transmit status

[Format]				
	ASCII	GS	r	*n*
	Hex	1D	72	*n*
	Decimal	29	114	*n*

[Range] 1 *n* 2, 49 *n* 50

[Description] Transmits the status specified by n as follows:

n	Function
1, 49	Transmits paper sensor status
2, 50	Transmits drawer kick-out connector status

Paper sensor status (*n* = 1 , 49).

Bit	Off/On	Hex	Decimal	Status
0,1	-	-	-	Not used. Fixed to Off.
2,3	Off	00	0	Paper roll sensor: paper present.
	On	0C	12	Paper roll sensor: paper NOT present.
4	Off	00	0	Not used. Fixed to Off.
5,6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

Drawer kick-out connector status (*n* = 2, 50).

Bit	Off/On	Hex	Decimal	Status
0	Off	00	0	Drawer 1 or 2 connector status is LOW.
	On	01	1	Drawer 1 or 2 connector status is HIGH.
1-3	-	-	-	Undefined.
4	Off	00	0	Not used. Fixed to Off.
5,6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

DLE EOT *n* [E*]

[Name] Real-time status transmission

[Format]				
	ASCII	DLE	EOT	*n*
	Hex	10	04	*n*
	Decimal	16	4	*n*

[Range] 1 *n* 4

[Usage] Epson TM-T8x emulation mode only.

[Description] Transmits the selected printer status specified by *n* in real time, according to the following parameters:

n	Function
1	Transmit printer status
2	Transmit off-line status
3	Transmit error status
4	Transmit paper roll sensor status

Printer status (*n*=1)

Bit	Off/On	Hex	Decimal	Status
0	Off	00	0	Not used. Fixed to Off.
1	Off	02	2	Not used. Fixed to On.
2	Off	00	0	Drawer 1 or 2 kick-out connector status is LOW**.
	On	04	4	Drawer 1 or 2 kick-out connector status is HIGH**.
3	Off	00	0	On-Line.
	On	08	8	Off-Line.
4	On	10	16	Not used. Fixed to On.
5,6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

** See Chapter 1 for Cash drawer connector information.

Off-line status (*n*=2)

Bit	Off/On	Hex	Decimal	Status
0	Off	00	0	Not used. Fixed to Off.
1	On	02	2	Not used. Fixed to On.
2	Off	00	0	Cover is closed.
	On	04	4	Cover is open.
3	Off	00	0	Paper is not being fed by the FEED button.
	On	08	8	Paper is being fed by the FEED button.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	No paper-end stop.
	On	20	32	Printing stops due to paper-end.
6	Off	00	0	No error.
	On	40	64	Error occurred.
7	Off	00	0	Not used. Fixed to Off.

Error status (*n*=3)

Bit	Off/On	Hex	Decimal	Status
0	Off	00	0	Not used. Fixed to Off.
1	On	02	2	Not used. Fixed to On.
2	-	-	-	Undefined.
3	Off	00	0	No auto-cutter error.
	On	08	8	Auto-cutter error occurred.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	No unrecoverable error.
	On	20	32	Unrecoverable error occurred.
6	Off	00	0	No automatically recoverable error occurred.
	On	40	64	Automatically recoverable error occurred.
7	Off	00	0	Not used. Fixed to Off.

Paper roll sensor status (*n*=4)

Bit	Off/On	Hex	Decimal	Status
0	Off	00	0	Not used. Fixed to Off.
1	On	02	2	Not used. Fixed to On.
2, 3	Off	00	0	Paper roll near-end sensor: paper adequate.
	On	0C	12	Paper roll near-end sensor: paper near end.
4	On	10	16	Not used. Fixed to On.
5, 6	Off	00	0	Paper roll end sensor: paper present.
	On	60	96	Paper roll end sensor: paper not present.
7	Off	00	0	Not used. Fixed to Off.

ESC v [E]

[Name] Transmit printer status

[Format]

ASCII	ESC	v
Hex	1B	76
Decimal	27	118

[Description] Transmits the status of the paper sensor as 1 byte of data. When the paper roll end sensor detects a paper-end, the printer goes off line and does not execute this command until the paper-end condition is corrected.

Bit	Off/On	Hex	Decimal	Status
0,1	-	-	-	Not used. Fixed to Off.
2,3	Off	00	0	Paper roll sensor: paper present.
	On	0C	12	Paper roll sensor: paper NOT present.
4	Off	00	0	Not used. Fixed to Off.
5,6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

ESC u *n* **[E*]**

[Name] Transmit peripheral device status

[Format]				
	ASCII	ESC	u	*n*
	Hex	1B	75	*n*
	Decimal	27	117	*n*

[Range] *n* = 0, 48

[Usage] ***Epson TM-T8x emulation mode definition.**

[Description] Transmits the status of the draw kick-out connector as a byte when *n* = 0 or 48. This command allows the host to determine the status of a peripheral device.

Bit	Off/On	Hex	Decimal	Status
0	Off	00	0	Drawer 1 or 2 connector status is LOW.**
	On	01	1	Drawer 1 or 2 connector status is HIGH.**
1-3	-	-	-	Undefined.
4	Off	00	0	Not used. Fixed to Off.
5,6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

** See Chapter 1 for Cash drawer connector information.

ESC u *n* **[A]**

[Name] Request alternate status

[Format]				
	ASCII	ESC	u	*n*
	Hex	1B	75	*n*
	Decimal	27	117	*n*

[Range] See table below.

[Usage] ***Axiohm 7193 emulation mode definition, Parallel printer**.

[Description] Sends status data to the host system. This command is available only on Parallel printers and is intended for situations when the host computer requires status but is not capable of P1284 bi-directional communications. When this command is sent to the printer, the printer waits until all the data in the input buffer has been processed. The PAPER EXHAUST line then shows the status for the cash drawer or receipt paper as follows:

n	Function	Description
00	Drawer 1	High = Open Low = Closed or Not Present
01	Drawer 2	High = Open Low = Closed or Not Present
02	Paper Low (Not Implemented)	High = Paper Low Low = Not Used
03	Paper Out	High = Paper Out (Default) Low = Not Used
>03	Ignored, No Change	Printer Does Not Stay BUSY[1]

[1] PAPER EXHAUST LINE is valid to indicate previously requested status.

ESC u 0 **[A*]**

[Name] Transmit cash drawer status

[Format]	ASCII	ESC	u	0
	Hex	1B	75	0
	Decimal	27	117	0

[Usage] ***Axiohm 7193 mode definition, Serial printer**.

[Description] Transmits current status of the cash drawers. One byte is sent to the host system. If a drawer is not connected, the status will indicate closed.

Bit	1 Signifies	0 Signifies
0	Drawer 1 Closed	Drawer 1 Open
1	Drawer 2 Closed	Drawer 2 Open

ESC v **[A]**

[Name] Transmit printer status

[Format]	ASCII	ESC	v
	Hex	1B	76
	Decimal	27	118

[Description] Sends one byte of status data to the host system. The printer will always respond with a NULL character (00 Hex) indicating a no fault condition. If the printer has one of the error conditions indicated in the table below, it will go busy and not respond.

Bit	Status	0 Signifies
0	Receipt Paper	Present
1	Receipt Cover	Closed
2	Receipt Paper	Present
3	Knife	OK
4	Not Used	
5	Printhead	OK
6	Input Voltage	OK
7	Not Used	

Bar Code Commands

GS h *n* **[EA]**

[Name] Set bar code height

[Format]				
	ASCII	GS	h	*n*
	Hex	1D	68	*n*
	Decimal	29	104	*n*

[Range] 1 *n* 255

[Default]

[*Epson TM-T8x*] 0.90 inches high

[*Axiohm 7193*] 1.06 inches high

[Description] Sets the height of the bar code.

Bar code height is set to [*n*/180] inches in Epson emulation mode.
Bar code height is set to [*n*/152] inches for Axiohm emulation mode.

GS w n **[EA]**

[Name] Set bar code width

[Format]				
	ASCII	GS	w	*n*
	Hex	1D	77	*n*
	Decimal	29	119	*n*

[Range] 1 *n* 6

[Default] *n* = 3

[Description] Set the horizontal side of the bar code. *n* specifies the bar code width as follows:

n	Module Width (mm) for Multi-level Bar Code	Binary-level Bar Code	
		Thin element width (mm)	Thick element width (mm)
1	0.125	0.125	0.375
2	0.250	0.250	0.625
3	0.375	0.375	1.000
4	0.500	0.500	1.250
5	0.625	0.625	1.625
6	0.750	0.750	2.000

Multi-level bar codes are as follows:
UPC-A, UPC-E, JAN13 (EAN 13), JAN 8 (EAN 8), CODE93, CODE128
Binary-level bar codes are as follows:
CODE39, ITF, CODABAR

[1] GS *k m d1...dk* NUL [2] GS *k m n d1...dn* [EA]

[Name] Print bar code

[Format]						
[1] ASCII	GS	k	*m*	*d1...dk*		NUL
Hex	1D	6B	*m*	*d1...dk*	00	
Decimal	29	107	*m*	*d1...dk*	0	
[2] ASCII	GS	k	*m*	*n*	*d1...dn*	
Hex	1D	6B	*m*	*n*	*d1...dn*	
Decimal	29	107	*m*	*n*	*d1...dn*	

[Range] [1] 0 *m* 6 (*k* and *d* depends on the bar code system used)
[2] 65 *m* 73 (*n* and *d* depends on the bar code system used)

[Description] Selects a bar code system and prints the bar code.
m selects a bar code system as follows:

m		Bar Code System	Number of Characters	Remarks
[1]	0	UPC-A	11 *k* 12	48 *d* 57
[1]	1	UPC-E	11 *k* 12	48 *d* 57
[1]	2	JAN13 (EAN 13)	12 *k* 13	48 *d* 57
[1]	3	JAN 8 (EAN 8)	7 *k* 8	48 *d* 57
[1]	4	CODE39	1 *k*	48 *d* 57, 65 *d* 90 *d* = 32, 36, 37, 43, 45, 46, 47
[1]	5	ITF	1 *k* (even number)	48 *d* 57
[1]	6	CODABAR	1 *k*	48 *d* 57, 65 *d* 68 *d* = 32, 36, 37, 43, 45, 46, 47, 58

m		Bar Code System	Number of Characters	Remarks
[2]	65	UPC-A	11 *k* 12	48 *d* 57
[2]	66	UPC-E	11 *k* 12	48 *d* 57
[2]	67	JAN13 (EAN 13)	12 *k* 13	48 *d* 57
[2]	68	JAN 8 (EAN 8)	7 *k* 8	48 *d* 57
[2]	69	CODE39	1 *n* 255	48 *d* 57, 65 *d* 90 *d* = 32, 36, 37, 43, 45, 46, 47
[2]	70	ITF	1 *n* 255 (even number)	48 *d* 57
[2]	71	CODABAR	1 *n* 255	48 *d* 57, 65 *d* 68 *d* = 32, 36, 37, 43, 45, 46, 47, 58
[2]	72	CODE93	1 *n* 255	0 *d* 127
[2]	73	CODE128	2 *n* 255	0 *d* 127

[Description for [1]]

d indicates the character code to be printed.

A **NULL** (00 Hex) character ends the bar code definition.

[Description for [2]]

n indicates the number of bytes of bar code data to be processed immediately following *n*.

d indicates the character code to be printed.

The following apply to both **GS *k m d1...dk* NUL** and **GS *k m n d1...dn***:

If the horizontal width exceeds the printing area, the printer only feeds the paper.

These commands feed as much paper as necessary to print the bar code according to the **GS h** command.

These commands are enabled only when no data exists in the print buffer. When data does exist in the print buffer, the printer processes the data following *m* as normal data.

After printing a bar code, the print position is set the beginning of the line.

These commands are not effected by print modes (emphasized, underline, character size...), except for upside-down mode.

GS H *n* **[EA]**

[Name]	Select printing position of HRI characters			
[Format]	ASCII	GS	H	*n*
	Hex	1D	48	*n*
	Decimal	29	72	*n*
[Range]	0 *n* 3, 48 *n* 51			

[Description] Selects the printing position of HRI characters when printing a bar code.

n selects the printing position as follows:

n	**Printing position**
0, 48	Not printed.
1, 49	Above bar code.
2, 50	Below bar code.
3, 51	Both above and below the bar code.

HRI indicates Human Readable Interpretation.

GS f *n* [E]

[Name]	Select font for Human Readable Interpretation (HRI) characters			
[Format]	ASCII	GS	f	*n*
	Hex	1D	66	*n*
	Decimal	29	102	*n*
[Range]	*n* = 0, 1, 48, 49			
[Description]	Selects a font for the HRI characters used when printing a bar code. *n* selects a font from the following table:			

n	**Font**
0, 48	Font A (13 24)
1, 49	Font B (10 24)

Macro Function Commands

GS : [E]

[Name]	Start/end macro definition		
[Format]	ASCII	GS	:
	Hex	1D	3A
	Decimal	29	58
[Description]	Starts or ends macro definition.		

Macro definition starts when this command is received during normal operation and ends when it is received during the macro definition.
The macro definition can contain up to 2048 bytes. If the definition exceeds this value, the excess data is not stored.

GS ^ *r t m* **[EI]**

[Name]	Execute macro					
[Format]	ASCII	GS	^	*r*	*t*	*m*
	Hex	1D	5E	*r*	*t*	*m*
	Decimal	29	94	*r*	*t*	*m*
[Range]	0 *r* 255					
	0 *t* 255					
	m = See below					
[Description]	Executes a macro.					

r specifies the number of times to execute the macro. When Bit 1 of *m* is set, *r* is ignored and the macro is executed infinitely.
t specifies the waiting time for executing the macro; it is *t* 100 msec for every macro execution.
m specifies macro executing mode.
When the LSB of *m* = 0:
The macro executes r times continuously with interval specified by *t*.
When the LSB of *m* = 1:
After waiting for the period specified by *t*, the printer remains idle and waits for the FEED button to be pressed. After the button is pressed, the printer executes the macro once. The printer repeats this operation *r* times.
When Bit 4 of *m* is set, the current macro definition is saved into the printers non-volatile eeprom memory as a startup macro without executing it. This macro definition will be executed upon power-up using the parameters specified by this command. If the printer is powered-up into ***self-test*** mode, the macro definition will not be executed. A saved macro definition can be deleted with the **GS _** command.
NOTE: Creating a startup macro reduces the eeprom storage area by 2048 bytes for the duration of that macro and erases the previous contents of the eeprom buffer. Any user defined characters sets or bit-images must be redefined after creating a startup macro.

Definition of Mode byte *m*:

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Macro executes *r* times continuously with the interval specified by *t*.
	On	01	1	FEED button controlled operation with time interval *t*.
1	Off	00	0	Value given by *r* determines number of repetitions.
	On	02	2	Value given by *r* is ignored and macro is run infinitely.
2-3	-	-	-	Undefined
4	Off	40	64	Save startup macro definition to eeprom memory without executing.
5-7	-	-	-	Undefined.

GS _ _ [I]

[Name]	Delete startup macro definition		
[Format]	ASCII	GS	_
	Hex	1D	5F
	Decimal	29	95
[Description]	Deletes a startup macro definition previously created by the **GS ^** command.		

If a startup macro was not previously defined, this command is ignored.
If a startup macro was previously defined, the macro definition is deleted and the space it occupied is returned to the eeprom buffer.
NOTE: Any user defined character sets or bit-images will be erased and must be redefined after deleting the startup macro.

Mechanism Control Commands

[1] GS V *m* [2] GS V *m n* [E]

[Name]	Select cut mode and cut paper				
[Format]	[1]ASCII	GS	V	*m*	
	Hex	1D	56	*m*	
	Decimal	29	86	*m*	
	[2]ASCII	GS	V	*m*	*n*
	Hex	1D	56	*m*	*n*
	Decimal	29	86	*m*	*n*
[Range]	[1]*m* = 1, 49				
	[2]*m* = 65, 66, 0 *n* 255				
[Description]	Selects a mode for cutting paper and executes paper cutting. The value of m selects the mode as follows:				

m	**Print mode**
1, 49	Partial cut
65, 66	Feeds paper (cutting position + (*n* (vertical motion unit)]), and performs a partial cut.

ESC i [EA]

[Name]	Partial Knife Cut		
[Format]	ASCII	ESC	i
	Hex	1B	69
	Decimal	27	105
[Description]	Performs a partial knife cut.		

EM **[EA]**

[Name]	Full knife cut	
[Format]	ASCII	EM
	Hex	19
	Decimal	25
[Description]	This command is implemented the same as partial knife cut, **ESC i**.	

SUB **[A]**

[Name]	Partial knife cut	
[Format]	ASCII	SUB
	Hex	1A
	Decimal	26
[Description]	Performs a partial knife cut.	

Miscellaneous Commands

GS P *x y* **[E]**

[Name]	Set horizontal and vertical motion units				
[Format]	ASCII	GS	P	*x*	*y*
	Hex	1D	50	*x*	*y*
	Decimal	29	80	*x*	*y*
[Range]	0 *x* 255				
	0 *y* 255				

[Default]
[*Epson TM-T8x*] *x* = 180, *y* = 360
[*Axiohm 7193*]*x* = 152, *y* = 152

[Description] Sets the horizontal and vertical motion units to 1/*x* inch and 1/*y* inches, respectively. When *x* and *y* are set to 0, the default setting of each value is used (see defaults above).

ESC @ **[EA]**

[Name]	Initialize printer		
[Format]	ASCII	ESC	@
	Hex	1B	40
	Decimal	27	64
[Description]	Clears the data in the print buffer and resets the printer to the mode that was in effect when the power was turned on.		

DLE **[A*]**

[Name]	Clear printer	
[Format]	ASCII	DLE
	Hex	10
	Decimal	16

[Usage] ***Axiohm 7193 emulation mode only.**
[Description] Clears the print line buffer without printing and sets the printer to following condition:

Double-Wide (**12** dec) command is canceled.
Line Spacing, Pitch, and User-Defined Character Sets and bit-images in RAM are unaffected.
Single-Wide, Single-High, Non-Rotated, and Left-Aligned characters are set.
Printer is restarted and error status is cleared in a fault condition.
Returns paper exhaust to the paper status if an alternate status has been requested using the **ESC u** command. (Parallel interface only)

GS I *n* **[E]**

[Name] Transmit printer ID

[Format]				
	ASCII	GS	I	*n*
	Hex	1D	49	*n*
	Decimal	29	73	*n*

[Range] 1 *n* 3, 49 *n* 51
[Description] Transmits the printer ID specified by *n* as follows:

n	**Printer ID**	**Specification**	**ID (hex)**
1, 49	Printer model ID	Epson TM-T88/T88P Epson TM-T85 Axiohm 7193	20 08 71
2, 50	Type ID	See Table below.	
3, 51	ROM version ID	not implemented, returns zero.	

***n* = 2, Type ID**

Bit	**Off/On**	**Hex**	**Decimal**	**Function**
0	Off	00	0	Not used. Fixed to Off.
1	On	02	2	Auto-cutter equipped.
2, 3	-	-	-	Undefined.
4	Off	00	0	Not used. Fixed to Off.
5, 6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

ESC p m *t1 t2* **[EA]**

[Name] Generate pulse

[Format]						
	ASCII	ESC	p	*m*	*t1*	*t2*
	Hex	1B	70	*m*	*t1*	*t2*
	Decimal	27	112	*m*	*tl*	*t2*

[Range] *m* = 0, 1, 48, 49
0 *t1* 255, 0 *t2* 255

[Description] Outputs the pulse specified by *t1* and *t2* to connector pin m as follows:
Pulse ON time = (*t1* * 2ms) , Pulse OFF time = (*t2* * 2ms)

m	**Connector pin**
0, 48	Drawer 1 kick-out connector pin 5.
1, 49	Drawer 2 kick-out connector pin 1 (J9 2-3). Configurable to pin 5 via jumper (J9 1-2).

** See Appendix X for Cash drawer connector information.

ESC = *n* **[EA]**

[Name] Set peripheral device

[Format]	ASCII	ESC	=	*n*
	Hex	1B	3D	*n*
	Decimal	27	61	*n*

[Range] 1 *n* 255

[Description] Selects device to which host computer sends data, using *n* as follows:

Bit	**Off/On**	**Hex**	**Decimal**	**Function**
0	Off	00	0	Printer disabled.
	On	01	1	Printer enabled.
1-7	-	-	-	Undefined.

When the printer is disabled, it ignores all received data with the exception of the **ESC =, DLE ENQ 1** and **DLE ENQ 2** commands.
If ASB is enabled when the printer is disabled by the **ESC =** command, the printer transmits a 4-byte status message whenever the status changes.

DLE ENQ *n* **[E*]**

[Name] Real-time request to printer

[Format]	ASCII	DLE	ENQ	*n*
	Hex	10	05	*n*
	Decimal	16	5	*n*

[Range] 1 *n* 2

[Usage] ***Epson TM-T8x emulation mode only.**

[Description] Responds to a request from the host computer. *n* specifies the request as follows:

n	**Request**
1	Recover from an error and restart printing from the line where the error occurred
2	Recover from an error after clearing the receive and print buffers

When an auto-cutter error occurs, the printer can attempt to recover from the error by using this command without turning the printer off.

ESC ‘ *n* **[I]**

[Name]	Copy user defined storage buffers			
[Format]	ASCII	ESC	‘	*n*
	Hex	1B	27	*n*
	Decimal	27	39	*n*
[Description]	Copies data between user defined RAM buffer and the non-volatile eeprom buffer.			

When the LSB of *n* is 0,

The content of the user defined ram buffer (containing user defined bit-image or character set) is copied into the non-volatile eeprom storage buffer. The printer will go busy and remain in that state momentarily while the write is taking place.
Data in the eeprom storage buffer will remain intact indefinitely or until the data is rewritten with the **ESC ‘** command.

When the LSB of *n* is 1,

The content of the non-volatile eeprom storage buffer (containing user defined bit-image or character set) is copied into the user defined ram buffer.
Data in the RAM storage buffer will remain intact until it is cleared with the **ESC @** command or the printer is powered off.

User defined bit-images or character sets stored in the RAM or non-volatile eeprom buffer can be accessed with the **GS /** and **ESC %** commands.

Extended Language Control Commands

The Model 80 Printer is available with extended language support. The Standard Epson and Axiohm commands do not address these features. To allow applications to take advantage of these features the following commands have been added or extended.

ESC R *n*

[Name] Select an international character set

[Format]	ASCII	ESC	R	*n*
	Hex	1B	52	*n*
	Decimal	27	82	*n*

[Range] 0 *n* 74

[Default] *n* = 0

[Description] Selects an international character set *n* from the following table:

Country	Epson ID	Country	Epson ID	Country	Epson ID
ASCII	0	Swiss II	20	Windows Greek	50
French	1	Cyrillic II-866	21	Latin 5 (Windows Turkey)	51
German	2	Polska Mazovia	22	Windows Cyrillic	52
British	3	ISO Latin 2	23	Hungarian CWI	54
Danish I	4	Serbo Croatic I	24	Kamenicky (MJK)	55
Swedish I	5	Serbo Croatic II	25	ISO Latin 4 (8859/4)	56
Italian	6	Multilingual	26	Turkey_857	57
Spanish I	7	Norway	27	Roman-8	58
Japanese	8	Portugal	28	Hebrew NC (862)	60
Norwegian	9	Turkey	29	Hebrew OC	61
Danish II	10	Greek 437	38	Windows Hebrew	62
Spanish II	11	Greek 928	39	KBL- Lithuanian	63
Latin American	12	Greek 437 CYPRUS	41	Publisher	64
French Canadian	13	ECMA-94	42	Ukrainian	66
Dutch	14	Canada French	43	ISO Latin 6 (8859/10)	67
Swedish II	15	Cyrillic I-855	44	Windows Baltic	68
Swedish III	16	Cyrillic II-866	45	Cyrillic-Latvian	69
Swedish IV	17	East Europe Latin II-852	46	Bulgarian	72
Turkish	18	Greek 869	47	Icelandic-861	73
Swiss I	19	Windows East Europe	49	Baltic 774	74

ESC [T n_H n_L

[Name] Select character code table

[Format]	ASCII	ESC	[	T	n_H	n_L
	Hex	1B	5B	54	n_H	n_L
	Decimal	27	91	84	n_H	n_L

[Range] *See table below*

[Default] $n_H = 1, n_L = 181$ *(Code Page 437)*

[Description] Selects a page *n* from the character code table.

Code Page	Country	Decimal <n_h> <n_l>	Hex <n_h> <n_l>	Code Page	Country	Decimal <n_h> <n_l>	Hex <n_h> <n_l>
64	USA (Slashed 0)	0,64	0H,040H	869	Greek 869	3,101	3H,065H
65	USA(Unslashed 0)	0,65	0H,041H	874	Thailand	3,106	3H,06AH
66	British	0,66	0H,042H	895	Kamenicky (MJK)	3,127	3H,07FH
67	German	0,67	0H,043H	1008	Greek 437	3,240	3H,0F0H
68	French	0,68	0H,044H	1009	Greek 928	3,241	3H,0F1H
69	Swedish I	0,69	0H,045H	1011	Greek 437 CYPRUS	3,243	3H,0F3H
70	Danish	0,70	0H,046H	1012	Turkey	3,244	3H,0F4H
71	Norwegian	0,71	0H,047H	1013	Cyrillic II-866	3,245	3H,0F5H
72	Dutch	0,72	0H,048H	1014	Polska Mazovia	3,246	3H,0F6H
73	Italian	0,73	0H,049H	1015	ISO Latin 2	3,247	3H,0F7H
74	French Canadian	0,74	0H,04AH	1016	Serbo Croatic I	3,248	3H,0F8H
75	Spanish	0,75	0H,04BH	1017	Serbo Croatic II	3,249	3H,0F9H
76	Swedish II	0,76	0H,04CH	1018	ECMA-94	3,250	3H,0FAH
77	Swedish III	0,77	0H,04DH	1019	Windows East Europe	3,251	3H,0FBH
78	Swedish IV	0,78	0H,04EH	1020	Windows Greek	3,252	3H,0FCH
79	Turkish	0,79	0H,04FH	1021	Latin 5 (Windows Turkey)	3,253	3H,0FDH
80	Swiss I	0,80	0H,050H	1022	Windows Cyrillic	3,254	3H,0FEH
81	Swiss II	0,81	0H,051H	1024	Hungarian CWI	4,0	4H,000H
90	Publisher	0,90	0H,05AH	1026	ISO Latin 4 (8859/4)	4,2	4H,002H
91	Welsh	0,91	0H,05BH	1027	Ukrainian	4,3	4H,003H
437	USA	1,181	1H,0B5H	1028	Roman-8	4,4	4H,004H
774	Baltic 774	3,6	3H,006H	1029	ISO Latin 6 (8859/10)	4,5	4H,005H
850	Multilingual	3,82	3H,052H	1030	Hebrew NC (862)	4,6	4H,006H
852	East Europe Latin II-852	3,84	3H,054H	1031	Hebrew OC	4,7	4H,007H
855	Cyrillic I-855	3,87	3H,057H	1032	Windows Hebrew	4,8	4H.008H
857	Turkey 857	3,89	3H,059H	1033	KBL- Lithuanian	4,9	4H,009H
860	Portugal	3,92	3H,05CH	1034	Windows Baltic	4,10	4H,00AH
861	Icelandic-861	3,93	3H,05DH	1035	Cyrillic-Latvian	4,11	4H,00BH
862	Hebrew NC (862)	3,94	3H,05EH	1072	Bulgarian	4,48	4H,030H
863	Canada French	3,95	3H,05FH				
865	Norway	3,97	3H,061H				
866	Cyrillic II-866	3,98	3H,062H				

The Code page Field is a 16 Bit field that is equivalent to the code page number. (ex. 1 * 256 + 181 = 437)

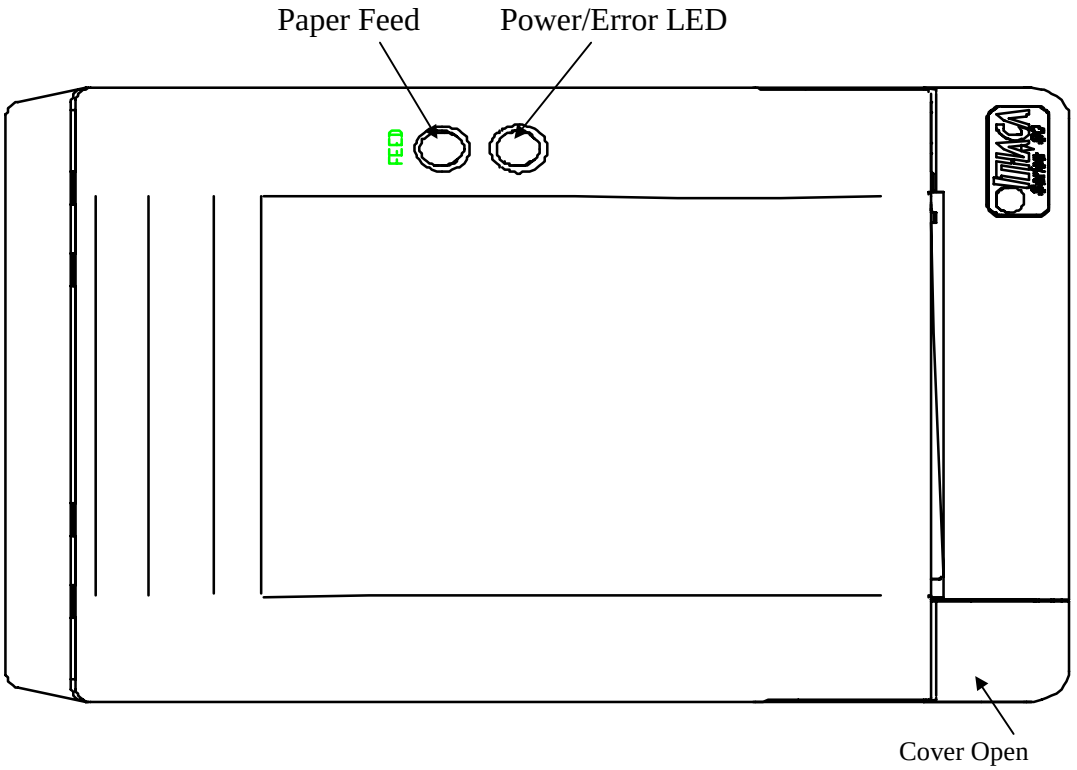
ESC ^ *n*

[Name]	Print Control Character			
[Format]	ASCII	ESC	^	*n*
	Hex	1B	5E	*n*
	Decimal	27	94	*n*
[Range]	0 *n* 255			
[Description]	This command allows characters from 0 - 31 codes to be printed. In normal operation characters from 0 - 31 are control characters. This command turns off control code translation for character *n*.			

CHAPTER 4

Operator Panel Controls

Operator Controls consist of one push button and one LED. The location and functionality of these controls are as follows:



Cover Open Button

The release button on the front of the series 80 printer that opens the cover of the printer exposing the printer paper roll.

Line Feed Button

The small circular button located on the printer top cover has several functions depending on the state of the printer, when the button is pressed,the functions of the Line Feed button are as follows:

When the printer is in the normal operational state and the panel button is depressed for a short duration the printer will feed the paper to a point exposing the last printed line to the user; further depression of the button will result in the activation of the 4 inch/second slew mode in the printer until the button is released.

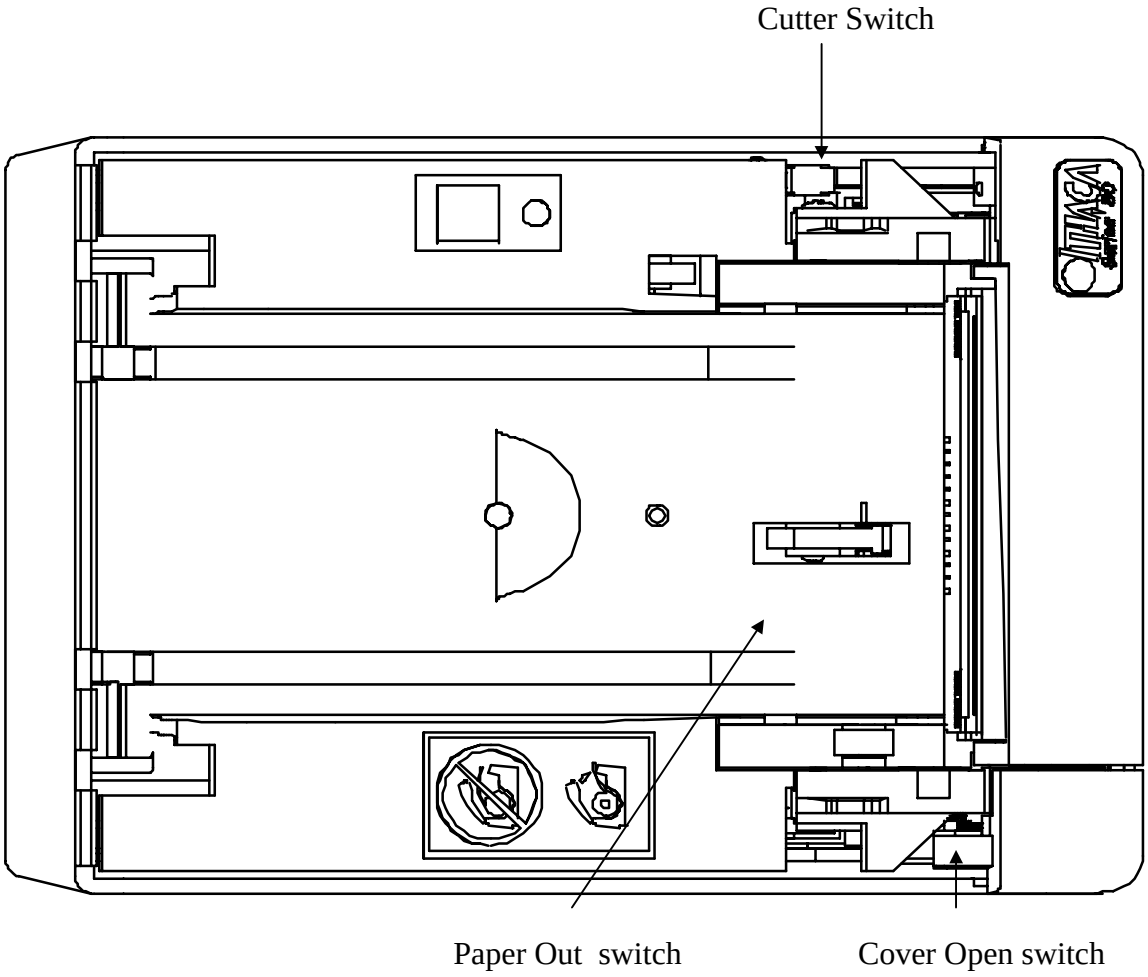
If the Button is depressed during the printer reset cycle its operation varies, depending on what operating mode you wish to enter into, reference the manual section on **Self -test**, or **configuring the printer** for more details.

Power/Error LED

The power/error led indicates a power on state during normal operation. The led will flash when the printer enters any error state. See Appendix B for the printer flash code definition.

Printer State Control Switches

The Model 82 printer monitors the state of the printer based on the position of several switches housed in the mechanism. The switches monitor the printer with respect to the availability of paper, the position of the cover and the position of the cutter mechanism.



Paper Out switch:

Mechanical switch used to indicate the presents of paper.

Cover Open switch:

Mechanical switch used to indicate a closed or opened cover.

Cutter position switch:

Mechanical switch used to indicate proper homing of the cutter mechanism.

CHAPTER 5

Trouble Shooting

Chapter 5

Hexadecimal Dump

This feature allows experienced users to see exactly what data is being received by the printer. This can be useful in finding software problems. When you turn on the hex dump function, the printer prints all commands and other data in hexadecimal format along with a guide section to help you find specific commands.
To use the hex dump feature, follow these steps:

1. Enter the printer's ***Remote Configuration*** and turn the Hexdump option ON. See Chapter 1 for information on using the ***Remote Configuration***.

2. Upon exiting the Remote Configuration or subsequently powering the unit on/off, the printer will print the following:

HEXADECIMAL DUMP

3. Run any software program that sends data to the printer. The printer prints all the codes it receives in a two-column format. The first column contains the hexadecimal codes and the second column gives the ASCII characters that correspond to the codes.

HEXADECIMAL DUMP

1B 21 00 1B 26 02 40 40 .!..&.@@
1B 25 01 1B 63 34 00 1B .%..c4..
41 42 43 44 45 46 47 48 ABCDEFGH

A period (.) is printed for each code that has no ASCII equivalent.
During the hex dump all commands except **DLE EOT** and **DLE ENQ** are disabled.

4. The printer will remain in this state the Hexdump mode is turned off in the ***Remote Configuration***.

Appendix A
Communications

OVERVIEW

In order for a receipt to be printed, a computer must be able to accept a data stream containing characters and commands that the host computer wished the printer to print. This chapter describes the various interfaces to allow this transmission of data.

Interfaces

In order for the printer to communicate with the host, a communication link must be set up. The Model 82 supports the following three communication interfaces:

RS-232C Interface
Parallel Interface
Rs485/422 Interface

Each of these has a protocol associated with it that the host must understand and adhere to. Only when the interface parameters are matched and the proper protocol is used will the host and the printer be able to communicate. See the respective sections in this chapter for a description of the protocol associated with each type of interface.

RS-232C INTERFACE

The RS-232C interface uses either RTS/CTS, DTR/DSR or XON/XOFF protocol. For RTS/CTS, changes in the RTS/CTS signal coordinates the information flow. For DTR/DSR, changes in the DTR/DSR signal coordinates the information flow. For XON/XOFF, data characters transmitted between the Host computer control communication data flow.

The RS-232C version of the Model 82 offers the standard communications options which are configured in the flash.

RTS/CTS PROTOCOL

The RTS signal is used to control data transmission to the printer. It is driven High when the printer is ready to receive data and driven low when it cannot accept any more data. The host will transmit data to the printer when it recognizes the state of the printers RTS signal is high.

DTR/DSR PROTOCOL

The DTR signal is used to control data transmission to the printer. It is driven High when the printer is ready to receive data and driven low when it cannot accept any more data. The host will transmit data to the printer when it recognizes the state of the printers DTR signal is high.

XON/XOFF PROTOCOL

ASCII characters coordinate the information transfer between the printer and the host system. The printer sends an ASCII DC1(11Hex,XON) character when it is ready to receive data and it sends an ASCII DC3(13Hex,XOFF) character when it cannot accept any more data. The host system must monitor the communication link as in order to send data at the appropriate times.

RS-232C TECHNICAL SPECIFICATIONS

This section describes the pin settings for the connectors and the RS-232C interface parameters.

Connectors

The following illustration shows the RS-232C communication connector and pin assignments. The connector is a 9-pin male D-shell connector and is located in the hollow cavity under the printer.

Pin #	Signal Name	Signal Function	PC Host Cross Connect Pin #
1	Received line Signal Detector	NOT USED	
2	Serial Receive	input signal to receive data from the host system	3 Tx
3	Serial Transmit	output signal sending data to the host system	2 Rx
4	Data Terminal Ready	output signal to float control the host	6 DSR
5	Ground	Logic Ground	5 GND
6	Data Set Ready	input signal Float control the printer	4 DTR
7	Request to Send	output signal to float control the host.	7 CTS
8	Clear to Send	input signal to float control the printer	6 RTD
9	Ring Indicator	NOT USED	

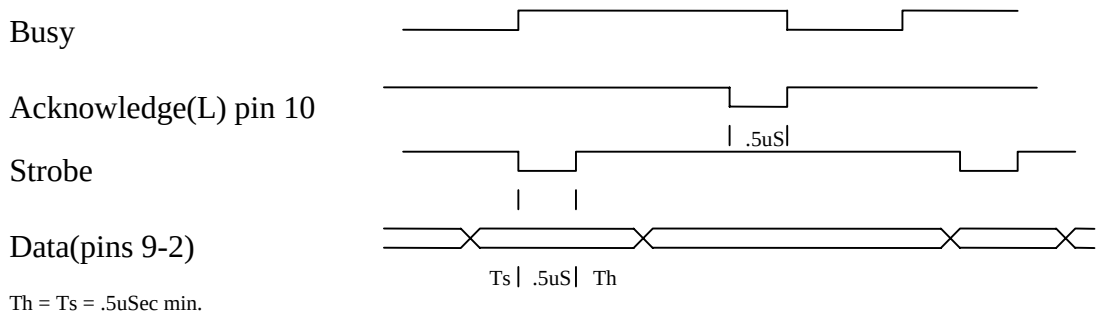
PARALLEL INTERFACE

PARALLEL INTERFACE SPECIFICATION (P1284)

Parallel Protocol

The Model 82 uses a standard PC-compatible parallel interface. The following illustration shows the timing diagram for the interface protocol.

Compatibility Mode:



Th = Ts = .5uSec min.

1. The Host places its data on the data lines.

2. The host strobes the data into the printer latch using Strobe(L)

3. The printer Goes Busy(H) until the printer is ready to receive the next byte.

4. The printer acknowledges receipt of the data byte by Pulsing ACK(L).

5. The printer removes Bush(H) to allow continuation of data flow.

Note:

Definition and timing of the Parallel P1284 interface is beyond the scope of this manual, for a complete description of this interface refer to the IEEE P1284 Specification.

PARALLEL TECHNICAL SPECIFICATIONS

This table describes the pin settings for the Parallel interface.

Pin 1	Strobe	Clock Data to printer	Host to Printer
Pin 2-9	D0-D7	Data	Host to Printer
Pin 10	ACK(L)	Printer Accepted Data	Printer to Host
Pin 11	Busy	Printer is Busy	Printer to Host
Pin 12	PE	Paper Out / Status	Printer to Host
Pin 13	SLCT	Printer Selected	Printer to Host
Pin 14	AUTOFD	Auto feed paper	Host to Printer
Pin 15	ERR(L)	Printer Error	Printer to Host
Pin 16	INIT(L)	Initialize the Printer	Host to Printer
Pin 17	SLIN	Select Printer	Host to Printer

Pin 18-25	GND	Ground	

Appendix B

Error Code Diagnosis

Description

The Series 80 ESC/POS thermal printer uses a single status LED to display on-line and error conditions. The tables below describe the types of error conditions possible and the patterns that the LED will flash for those conditions.

KEY to Graphical representation:

- • = LED IS ON for 0.5 seconds
- • = LED IS ON for 0.1 seconds
- _ = LED IS OFF for 0.5 seconds
- _ = LED IS OFF for 0.1 seconds

IN ORDER OR PRECEDENCE

Error Condition Present	Graphical Representation	Verbal Description
QSM RAM ERROR	_____•_•_•_•_•_•_•_____	(7 quick flashes)
RAM ERROR	_____•_•_____	(2 quick flashes)
EEPROM VERIFY ERROR	_____•_•_•_•_•_•_____	(6 quick flashes)
PRINTER NOT CONFIGURED	_____•_•_•_•_•_____	(5 quick flashes)
THERMAL HEAD OVERHEAT	_•_•_•_•_•_•_	(rapid, continuous)
CUTTER ERROR	_____•_•_•_____	(3 quick flashes)
COVER OPEN	_•_•_•_•_•_•_	(continuous)
PAPER OUT	_____••••••_____••••••_____	(slow, continuous)

Appendix C

Character Code Tables

The following pages show the character code tables.

HEX	Decimal	ASCII	HEX	Decimal	ASCII	HEX	Decimal	ASCII	HEX	Decimal	ASCII
00	0	NULL	20	32	SP	40	64	@	60	96	`
01	1	SOH	21	33	!	41	65	A	61	97	a
02	2	STX	22	34	“	42	66	B	62	98	b
03	3	ETX	23	35	#	43	67	C	63	99	c
04	4	EOT	24	36	$	44	68	D	64	100	d
05	5	ENQ	25	37	%	45	69	E	65	101	e
06	6	ACK	26	38	&	46	70	F	66	102	f
07	7	BEL	27	39		47	71	G	67	103	g
08	8	BS	28	40	(	48	72	H	68	104	h
09	9	HT	29	42	)	49	73	I	69	105	i
0A	10	LF	2A	42	*	4A	74	J	6A	106	j
0B	11	VT	2B	43	+	4B	75	K	6B	107	k
0C	12	FF	2C	44	,	4C	76	L	6C	108	l
0D	13	CR	2D	45	-	4D	77	M	6D	109	m
0E	14	SO	2E	46	>	4E	78	N	6E	110	n
0F	15	SI	2F	47	/	4F	79	O	6F	111	o
10	16	DEL	30	48	0	50	80	P	70	112	p
11	17	DC1	31	49	1	51	81	Q	71	113	q
12	18	DC2	32	50	2	52	82	R	72	114	r
13	19	DC3	33	51	3	53	83	S	73	115	s
14	20	DC4	34	52	4	54	84	T	74	116	t
15	21	NAK	35	53	5	55	85	U	75	117	u
16	22	SYN	36	54	6	56	86	V	76	118	v
17	23	ETB	37	55	7	57	87	W	77	119	w
18	24	CAN	38	56	8	58	88	X	78	120	x
19	25	EM	39	57	9	59	89	Y	79	121	y
1A	26	SUB	3A	58	:	5A	90	Z	7A	122	z
1B	27	ESC	3B	59	;	5B	91	[	7B	123	{
1C	28	FS	3C	60	<	5C	92	\	7C	124	
1D	29	GS	3D	61	=	5D	93	]	7D	125	}
1E	30	RS	3E	62	>	5E	94	^	7E	126	
1F	31	US	3F	63	?	5F	95	_	7F	127	(SP)

HEX	Decimal	ASCII	HEX	Decimal	ASCII	HEX	Decimal	ASCII	HEX	Decimal	ASCII
80	128	ç	A0	160	á	C0	192	•	E0	224	a
81	129	ü	A1	161	í	C1	193	•	E1	225	ß
82	130	é	A2	162	ó	C2	194	•	E2	226	•
83	131	â	A3	163	ú	C3	195	•	E3	227	•
84	132	ä	A4	164	ñ	C4	196	•	E4	228	•
85	133	à	A5	165	Ñ	C5	197	•	E5	229	•
86	134	å	A6	166	a	C6	198	•	E6	230	µ
87	135	ç	A7	167	o	C7	199	•	E7	231	•
88	136	ê	A8	168	¿	C8	200	•	E8	232	•
89	137	ë	A9	169	•	C9	201	•	E9	233	•
8A	138	è	AA	170	¬	CA	202	•	EA	234	•
8B	139	ï	AB	171	½	CB	203	•	EB	235	•
8C	140	î	AC	172	¼	CC	204	•	EC	236	•
8D	141	ì	AD	173	¡	CD	205	•	ED	237	•
8E	142	Ä	AE	174	«	CE	206	•	EE	238	•
8F	143	Å	AF	175	»	CF	207	•	EF	239	•
90	144	É	B0	176	•	D0	208	•	F0	240	•
91	145	æ	B1	177	•	D1	209	•	F1	241	±
92	146	Æ	B2	178	•	D2	210	•	F2	242	•
93	147	ô	B3	179	┃	D3	211	•	F3	243	•
94	148	ö	B4	180	•	D4	212	•	F4	244	•
95	149	ò	B5	181	•	D5	213	•	F5	245	•
96	150	û	B6	182	•	D6	214	•	F6	246	÷
97	151	ù	B7	183	•	D7	215	•	F7	247	•
98	152	ÿ	B8	184	•	D8	216	•	F8	248	°
99	153	ö	B9	185	•	D9	217	•	F9	249	·
9A	154	ü	BA	186	•	DA	218	•	FA	250	·
9B	155	¢	BB	187	•	DB	219	•	FB	251	•
9C	156	£	BC	188	•	DC	220	•	FC	252	•
9D	157	¥	BD	189	•	DD	221	•	FD	253	²
9E	158		BE	190	•	DE	222	•	FE	254	•
9F	159	*f*	BF	191	•	DF	223	•	FF	255	SP

Page 0 (PC437: U.S.A., Standard Europe)
(International character set: U.S.A.)

NOTE: *The character code tables show only which characters are printed. They do not show the actual print pattern.*

HEX	Decimal	ASCII	HEX	Decimal	ASCII	HEX	Decimal	ASCII	HEX	Decimal	ASCII
80	128	Ç	A0	160	á	C0	192	•	E0	224	•
81	129	ü	A1	161	í	C1	193	•	E1	225	ß
82	130	é	A2	162	ó	C2	194	•	E2	226	Ô
83	131	â	A3	163	ú	C3	195	•	E3	227	Ò
84	132	ä	A4	164	ñ	C4	196	•	E4	228	Õ
85	133	à	A5	165	Ñ	C5	197	+	E5	229	Õ
86	134	å	A6	166	a	C6	198	ã	E6	230	µ
87	135	ç	A7	167	o	C7	199	Ã	E7	231	þ
88	136	ê	A8	168	¿	C8	200	•	E8	232	Þ
89	137	ë	A9	169	®	C9	201	•	E9	233	Ú
8A	138	è	AA	170	¬	CA	202	•	EA	234	Û
8B	139	ï	AB	171	½	CB	203	•	EB	235	Ù
8C	140	î	AC	172	¼	CC	204	•	EC	236	ý
8D	141	ì	AD	173	¡	CD	205	•	ED	237	Ý
8E	142	Ä	AE	174	«	CE	206	•	EE	238	—
8F	143	Å	AF	175	»	CF	207	¤	EF	239	´
90	144	É	B0	176	•	D0	208	ð	F0	240	–
91	145	æ	B1	177	•	D1	209	Ð	F1	241	±
92	146	Æ	B2	178	•	D2	210	Ê	F2	242	•
93	147	ô	B3	179	•	D3	211	Ë	F3	243	¾
94	148	ö	B4	180	•	D4	212	È	F4	244	¶
95	149	ò	B5	181	Á	D5	213	i	F5	245	§
96	150	û	B6	182	Â	D6	214	Í	F6	246	÷
97	151	ù	B7	183	À	D7	215	Î	F7	247	`
98	152	ÿ	B8	184	©	D8	216	Ï	F8	248	°
99	153	ö	B9	185	•	D9	217	•	F9	249	¨
9A	154	Ü	BA	186	•	DA	218	•	FA	250	·
9B	155	ø	BB	187	•	DB	219	•	FB	251	1
9C	156	£	BC	188	•	DC	220	•	FC	252	3
9D	157	Ø	BD	189	¢	DD	221		FD	253	2
9E	158	×	BE	190	¥	DE	222	Ì	FE	254	•
9F	159	ƒ	BF	191	•	DF	223	•	FF	255	SP

Page 1 (PC850: Multilingual)
Page 2 (PC850: Multilingual)

HEX	Decimal	ASCII	HEX	Decimal	ASCII	HEX	Decimal	ASCII	HEX	Decimal	ASCII
80	128	Ç	A0	160	á	C0	192	•	E0	224	a
81	129	ü	A1	161	í	C1	193	•	E1	225	ß
82	130	é	A2	162	ó	C2	194	•	E2	226	
83	131	â	A3	163	ú	C3	195	•	E3	227	
84	132	ä	A4	164	ñ	C4	196	•	E4	228	
85	133	à	A5	165	Ñ	C5	197	+	E5	229	•
86	134	Á	A6	166	a	C6	198	•	E6	230	µ
87	135	ç	A7	167	o	C7	199	•	E7	231	•
88	136	ê	A8	168	¿	C8	200	•	E8	232	•
89	137	Ê	A9	169		C9	201	•	E9	233	•
8A	138	è	AA	170	¬	CA	202	•	EA	234	•
8B	139	Í	AB	171	½	CB	203	•	EB	235	•
8C	140	Ô	AC	172	¼	CC	204	•	EC	236	•
8D	141	ì	AD	173	¡	CD	205	•	ED	237	•
8E	142	Ã	AE	174	«	CE	206	•	EE	238	•
8F	143	Â	AF	175	»	CF	207	•	EF	239	•
90	144	É	B0	176	•	D0	208	•	F0	240	•
91	145	À	B1	177	•	D1	209	•	F1	241	±
92	146	È	B2	178	•	D2	210	•	F2	242	•
93	147	ô	B3	179	•	D3	211	•	F3	243	•
94	148	õ	B4	180	•	D4	212	•	F4	244	•
95	149	ò	B5	181	•	D5	213	•	F5	245	•
96	150	Ú	B6	182	•	D6	214	•	F6	246	÷
97	151	ù	B7	183	•	D7	215	•	F7	247	
98	152	Ì	B8	184	•	D8	216	•	F8	248	°
99	153	Õ	B9	185	•	D9	217	•	F9	249	
9A	154	Ü	BA	186	•	DA	218	•	FA	250	·
9B	155	¢	BB	187	•	DB	219	•	FB	251	•
9C	156	£	BC	188	•	DC	220	•	FC	252	n
9D	157	Ù	BD	189	•	DD	221	•	FD	253	2
9E	158		BE	190	•	DE	222	•	FE	254	•
9F	159	•	BF	191	•	DF	223	•	FF	255	SP

Page 3 (PC860: Portuguese)

HEX	Decimal	ASCII	HEX	Decimal	ASCII	HEX	Decimal	ASCII	HEX	Decimal	ASCII
80	128	Ç	A0	160		C0	192	•	E0	224	a
81	129	ü	A1	161	´	C1	193	•	E1	225	ß
82	130	é	A2	162	ó	C2	194	•	E2	226	
83	131	â	A3	163	ú	C3	195	•	E3	227	
84	132	Â	A4	164	¨	C4	196	•	E4	228	
85	133	à	A5	165	’	C5	197	+	E5	229	•
86	134	¶	A6	166	³	C6	198	•	E6	230	µ
87	135	ç	A7	167	¯	C7	199	•	E7	231	•
88	136	ê	A8	168	Î	C8	200	•	E8	232	•
89	137	ë	A9	169	•	C9	201	•	E9	233	•
8A	138	è	AA	170	¬	CA	202	•	EA	234	•
8B	139	ï	AB	171	½	CB	203	•	EB	235	•
8C	140	î	AC	172	¼	CC	204	•	EC	236	•
8D	141	—	AD	173	¾	CD	205	•	ED	237	•
8E	142	À	AE	174	«	CE	206	•	EE	238	•
8F	143	§	AF	175	»	CF	207	•	EF	239	•
90	144	É	B0	176	•	D0	208	•	F0	240	•
91	145	È	B1	177	•	D1	209	•	F1	241	±
92	146	Ê	B2	178	•	D2	210	•	F2	242	•
93	147	ô	B3	179	•	D3	211	•	F3	243	•
94	148	Ë	B4	180	•	D4	212	•	F4	244	•
95	149	Ï	B5	181	•	D5	213	•	F5	245	•
96	150	û	B6	182	•	D6	214	•	F6	246	÷
97	151	ù	B7	183	•	D7	215	•	F7	247	
98	152	¤	B8	184	•	D8	216	•	F8	248	°
99	153	Ô	B9	185	•	D9	217	•	F9	249	
9A	154	Ü	BA	186	•	DA	218	•	FA	250	·
9B	155	¢	BB	187	•	DB	219	•	FB	251	•
9C	156	£	BC	188	•	DC	220	•	FC	252	n
9D	157	Ù	BD	189	•	DD	221	•	FD	253	2
9E	158	Û	BE	190	•	DE	222	•	FE	254	•
9F	159	*f*	BF	191	•	DF	223	•	FF	255	SP

Page 4 (PC863: Canadian-French)

HEX	Decimal	ASCII	HEX	Decimal	ASCII	HEX	Decimal	ASCII	HEX	Decimal	ASCII
80	128	Ç	A0	160	á	C0	192	•	E0	224	a
81	129	ü	A1	161	í	C1	193	•	E1	225	ß
82	130	é	A2	162	ó	C2	194	•	E2	226	
83	131	â	A3	163	ú	C3	195	•	E3	227	
84	132	ä	A4	164	ñ	C4	196	•	E4	228	
85	133	à	A5	165	Ñ	C5	197	+	E5	229	•
86	134	å	A6	166	a	C6	198	•	E6	230	µ
87	135	ç	A7	167	o	C7	199	•	E7	231	•
88	136	ê	A8	168	¿	C8	200	•	E8	232	•
89	137	ë	A9	169	•	C9	201	•	E9	233	•
8A	138	è	AA	170	¬	CA	202	•	EA	234	•
8B	139	ï	AB	171	½	CB	203	•	EB	235	•
8C	140	î	AC	172	¼	CC	204	•	EC	236	•
8D	141	ì	AD	173	¡	CD	205	•	ED	237	•
8E	142	Ä	AE	174	«	CE	206	•	EE	238	•
8F	143	Å	AF	175	¤	CF	207	•	EF	239	•
90	144	É	B0	176	•	D0	208	•	F0	240	•
91	145	æ	B1	177	•	D1	209	•	F1	241	±
92	146	Æ	B2	178	•	D2	210	•	F2	242	•
93	147	ô	B3	179	•	D3	211	•	F3	243	•
94	148	ö	B4	180	•	D4	212	•	F4	244	•
95	149	ò	B5	181	•	D5	213	•	F5	245	•
96	150	û	B6	182	•	D6	214	•	F6	246	÷
97	151	ù	B7	183	•	D7	215	•	F7	247	
98	152	ÿ	B8	184	•	D8	216	•	F8	248	°
99	153	ö	B9	185	•	D9	217	•	F9	249	
9A	154	Ü	BA	186	•	DA	218	•	FA	250	·
9B	155	ø	BB	187	•	DB	219	•	FB	251	•
9C	156	£	BC	188	•	DC	220	•	FC	252	n
9D	157	Ø	BD	189	•	DD	221	•	FD	253	2
9E	158		BE	190	•	DE	222	•	FE	254	•
9F	159	*f*	BF	191	•	DF	223	•	FF	255	SP

Page 5 (PC865: Nordic)

HEX	Decimal	ASCII	HEX	Decimal	ASCII	HEX	Decimal	ASCII	HEX	Decimal	ASCII
80	128	SP	A0	160	SP	C0	192	SP	E0	224	SP
81	129	SP	A1	161	SP	C1	193	SP	E1	225	SP
82	130	SP	A2	162	SP	C2	194	SP	E2	226	SP
83	131	SP	A3	163	SP	C3	195	SP	E3	227	SP
84	132	SP	A4	164	SP	C4	196	SP	E4	228	SP
85	133	SP	A5	165	SP	C5	197	SP	E5	229	SP
86	134	SP	A6	166	SP	C6	198	SP	E6	230	SP
87	135	SP	A7	167	SP	C7	199	SP	E7	231	SP
88	136	SP	A8	168	SP	C8	200	SP	E8	232	SP
89	137	SP	A9	169	SP	C9	201	SP	E9	233	SP
8A	138	SP	AA	170	SP	CA	202	SP	EA	234	SP
8B	139	SP	AB	171	SP	CB	203	SP	EB	235	SP
8C	140	SP	AC	172	SP	CC	204	SP	EC	236	SP
8D	141	SP	AD	173	SP	CD	205	SP	ED	237	SP
8E	142	SP	AE	174	SP	CE	206	SP	EE	238	SP
8F	143	SP	AF	175	SP	CF	207	SP	EF	239	SP
90	144	SP	B0	176	SP	D0	208	SP	F0	240	SP
91	145	SP	B1	177	SP	D1	209	SP	F1	241	SP
92	146	SP	B2	178	SP	D2	210	SP	F2	242	SP
93	147	SP	B3	179	SP	D3	211	SP	F3	243	SP
94	148	SP	B4	180	SP	D4	212	SP	F4	244	SP
95	149	SP	B5	181	SP	D5	213	SP	F5	245	SP
96	150	SP	B6	182	SP	D6	214	SP	F6	246	SP
97	151	SP	B7	183	SP	D7	215	SP	F7	247	SP
98	152	SP	B8	184	SP	D8	216	SP	F8	248	SP
99	153	SP	B9	185	SP	D9	217	SP	F9	249	SP
9A	154	SP	BA	186	SP	DA	218	SP	FA	250	SP
9B	155	SP	BB	187	SP	DB	219	SP	FB	251	SP
9C	156	SP	BC	188	SP	DC	220	SP	FC	252	SP
9D	157	SP	BD	189	SP	DD	221	SP	FD	253	SP
9E	158	SP	BE	190	SP	DE	222	SP	FE	254	SP
9F	159	SP	BF	191	SP	DF	223	SP	FF	255	SP

Page 255 (Space Page)

INTERNATIONAL CHARACTER SET

	ASCII Code												
Country	**HEX**	**23**	**24**	**40**	**5B**	**5C**	**5D**	**5E**	**60**	**7B**	**7C**	**7D**	**7E**
	DEC	**35**	**36**	**64**	**91**	**92**	**93**	**94**	**96**	**123**	**124**	**125**	**126**
U.S.A		#	$	@	[	\	]	^	`	{	¦	}	~
France		#	$	à	°	ç	§	^	`	é	ù	è	~
Germany		#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
U.K.		£	$	@	[	\	]	^	`	{	¦	}	~
Denmark I		#	$	@	Æ	Ø	Å	^	`	œ	ø	å	~
Sweden		#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
Italy		#	$	@	°	\	é	^	ù	à	ò	è	ì
Spain		PT	$	@	i	Ñ	¿	^	`	¨	ñ	}	~
Japan		#	$	@	[	¥	]	^	`	{	¦	}	~
Norway		#	¤	É	Æ	Ø	Å	Ü	é	œ	ø	å	ü
Denmark II		#	$	É	Æ	Ø	Å	Ü	é	œ	ø	å	ü

Appendix D

Upgrading/Changing your printer Operating System

The Series 80 thermal printer's operating system is stored on a non-volatile flash memory chip. The flash chip in your printer can be reprogrammed at any time using software utilities supplied by Ithaca. These utilities give you the ability to upgrades the capabilities of your printers operating system when newer versions become available, as well as load customized versions of it to meet your specific needs. All this process requires is that the Series 80 be connected to a host PC and the appropriate software utility then run; the entire process takes less than 3 minutes. Contact Ithaca or visit our web site for more information about obtaining updates.

Appendix E
Ordering Paper and Supplies

QUALIFIED SUPPLIERS FOR THERMAL PAPER

The following suppliers sell thermal paper that may be used if desired. Contact each company for information.

Original paper: T1012A, Superior

Appleton Paper Inc.
East Wisconsin Avenue
Appleton, WI 54912

Tel: (414) 734-9841
Fax: (414) 735-8796

Original paper: F380, P354

Kanzaki Specialty Papers, Inc.
Cummings Street
Ware, MA 01082 U.S.A.

Tel: (413) 967-6204
Fax: (413) 967-5723